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VOLUME III . APPENDIX

FINAL REPORT
SHUTTLE FILTER STUDY

Approved

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FOREWORD

Volume III of the "Shuttle Filter Study" Final Report contains test data obtained from flow resistance and contaminant tolerance tests on the various porous media evaluated in the different fluids. The data are presented in both graphical and tabular forms.

Test procedures for both flow resistance and contaminant tolerance testing are presented, and the development of a system for continuously adding contaminant at a predetermined rate to a flowing fluid stream is described.

Also included in this volume is a section describing the development effort of the self-indexing filter. This concept was adapted during this program for various Shuttle applications.

FIGURE A1

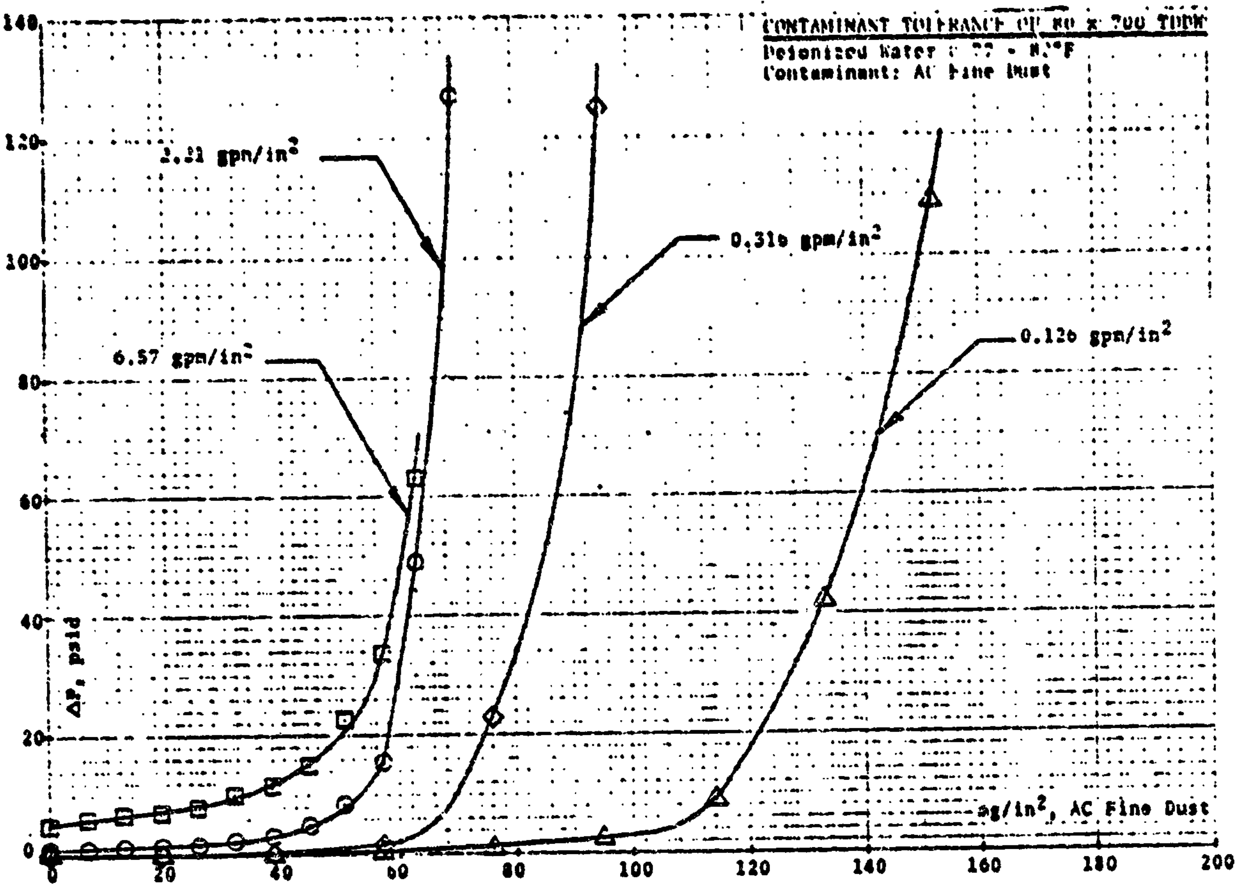


FIGURE A2

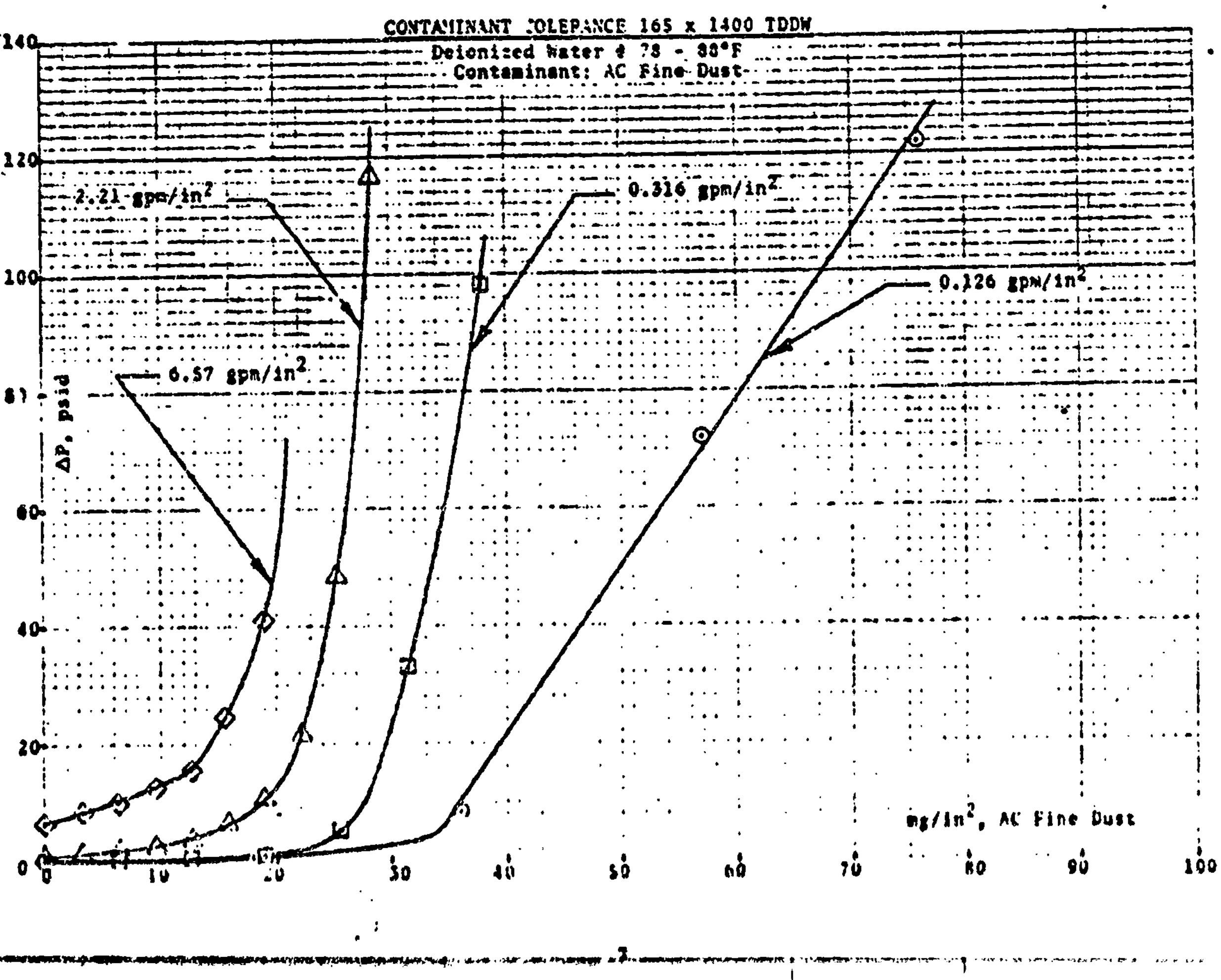


FIGURE A3

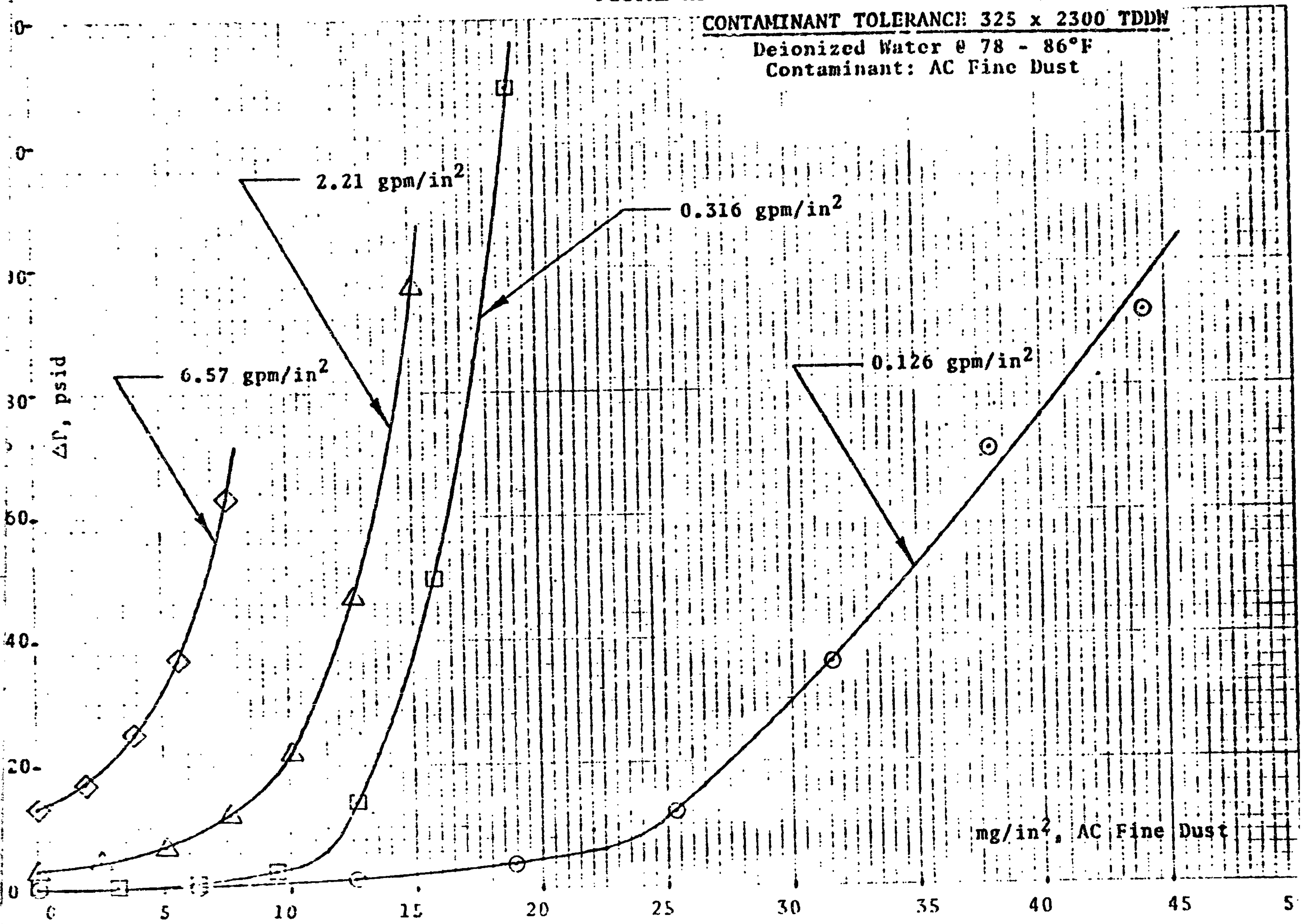
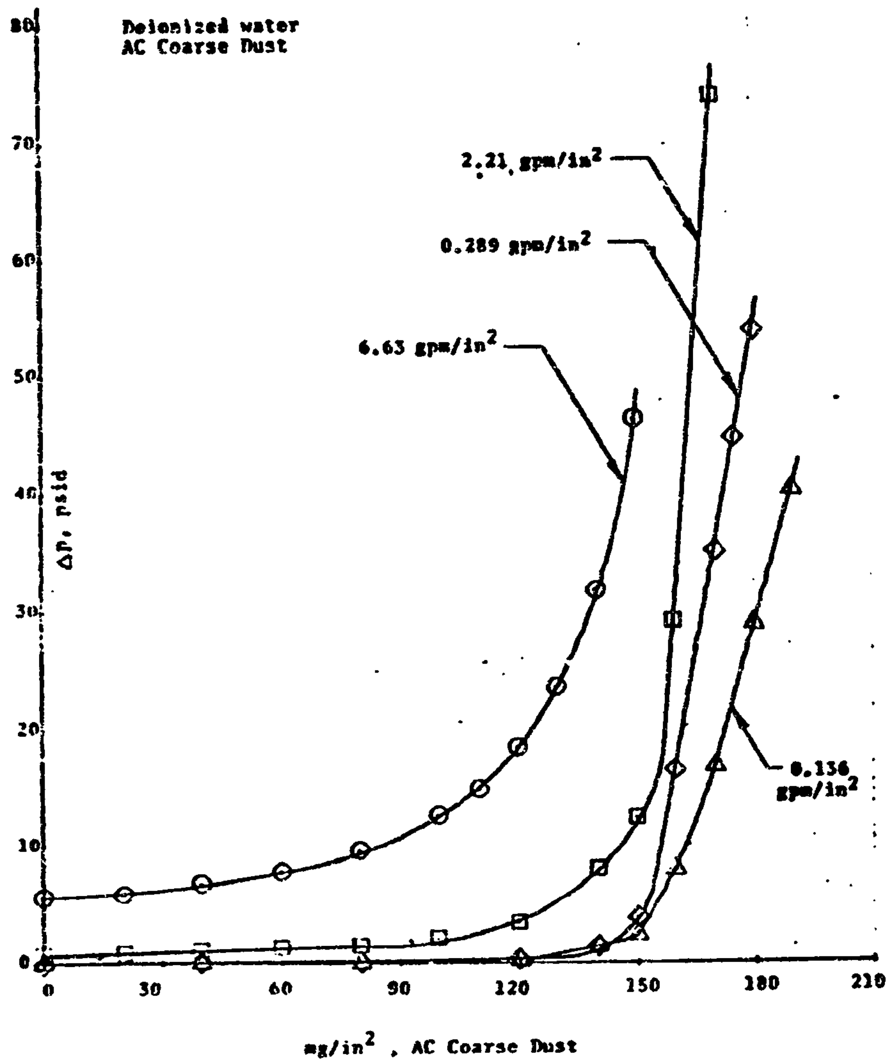

CONTAMINANT TOLERANCE 325 x 2300 TDDW
Deionized Water @ 78 - 86°F
Contaminant: AC Fine Dust
2.21 gpm/in²
0.316 gpm/in²
6.57 gpm/in²
0.126 gpm/in²
ΔP, psid
mg/in², AC Fine Dust
0
20
40
60
80
0
5
10
15
20
25
30
35
40
45
50

FIGURE A4

CONTAMINANT TOLERANCE 30 x 250 TDDW IN WATER



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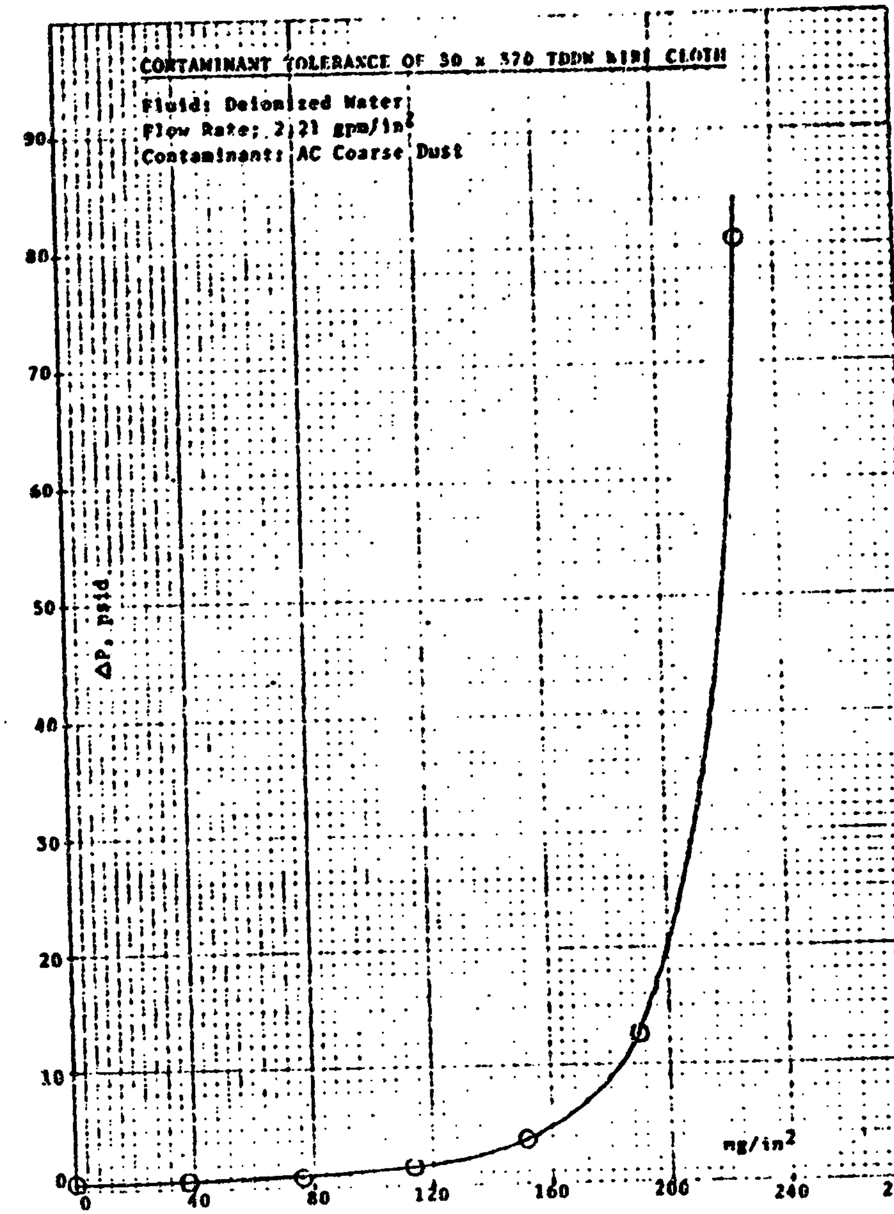

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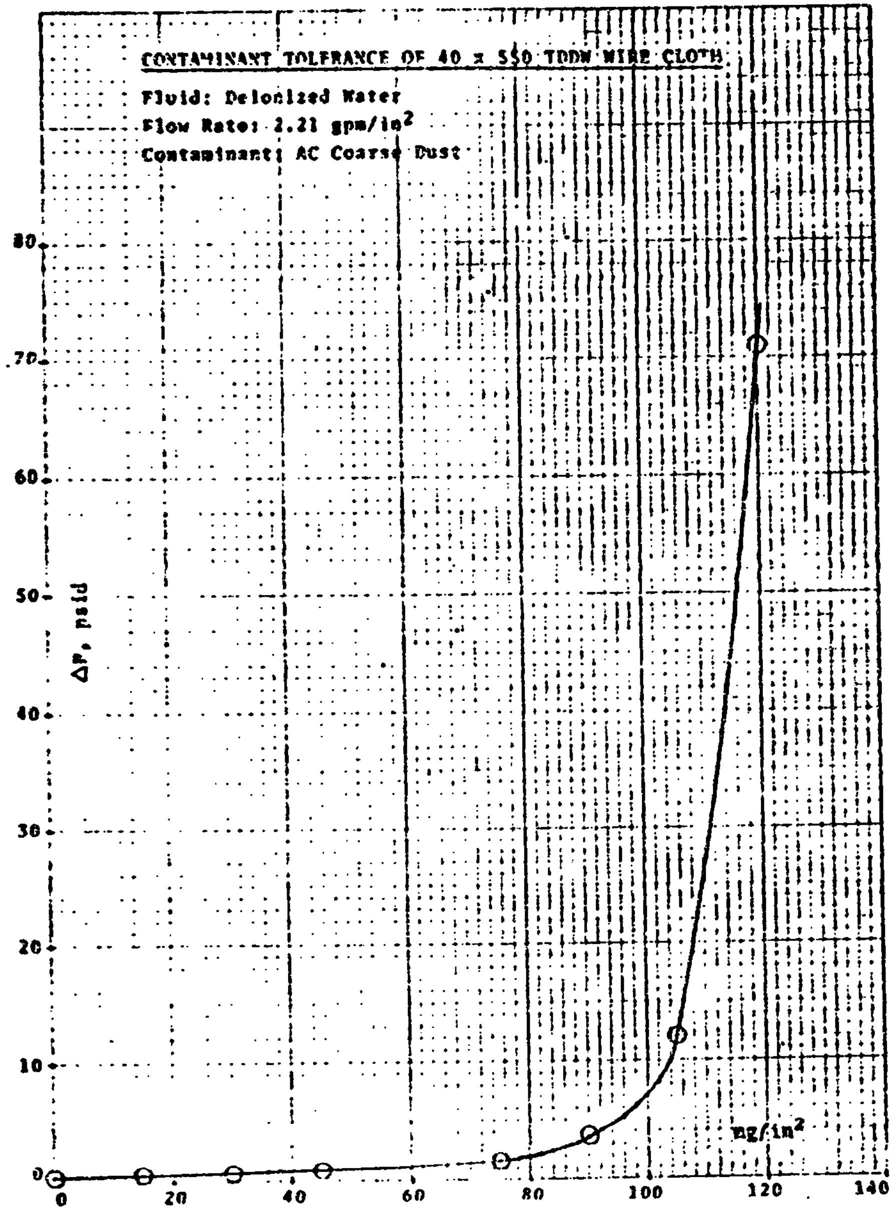
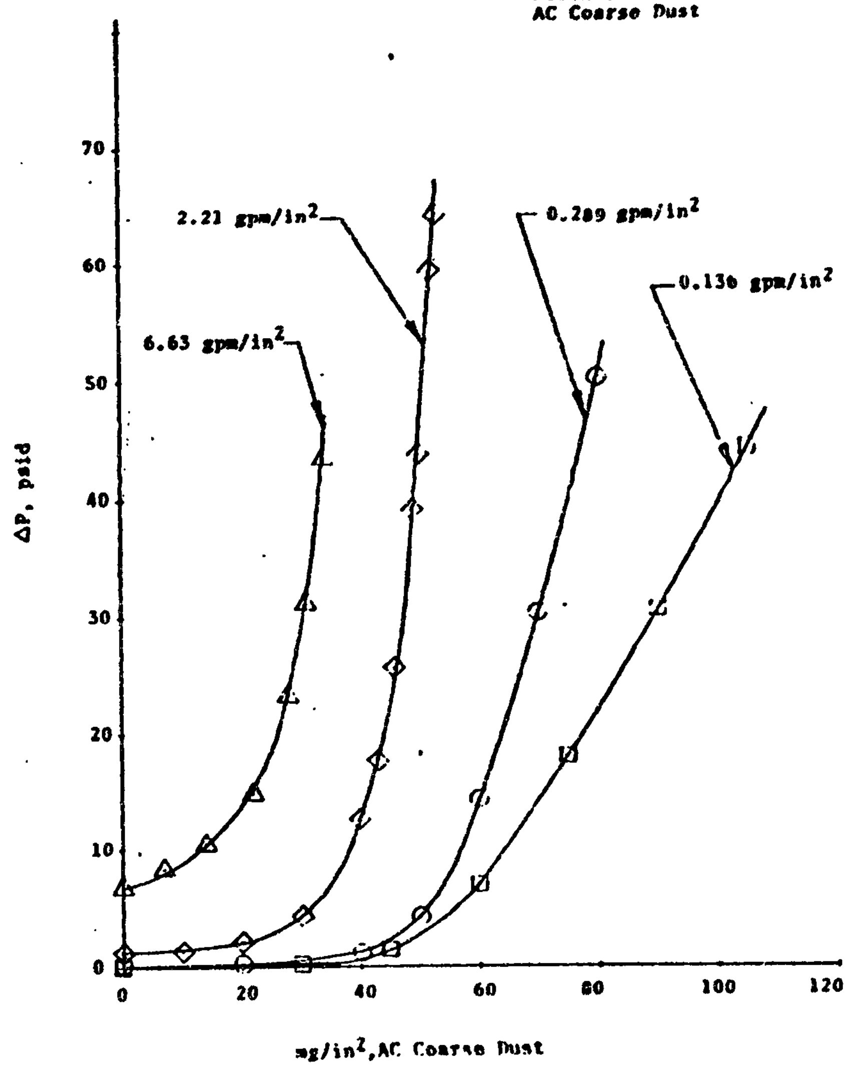


FIGURE A7



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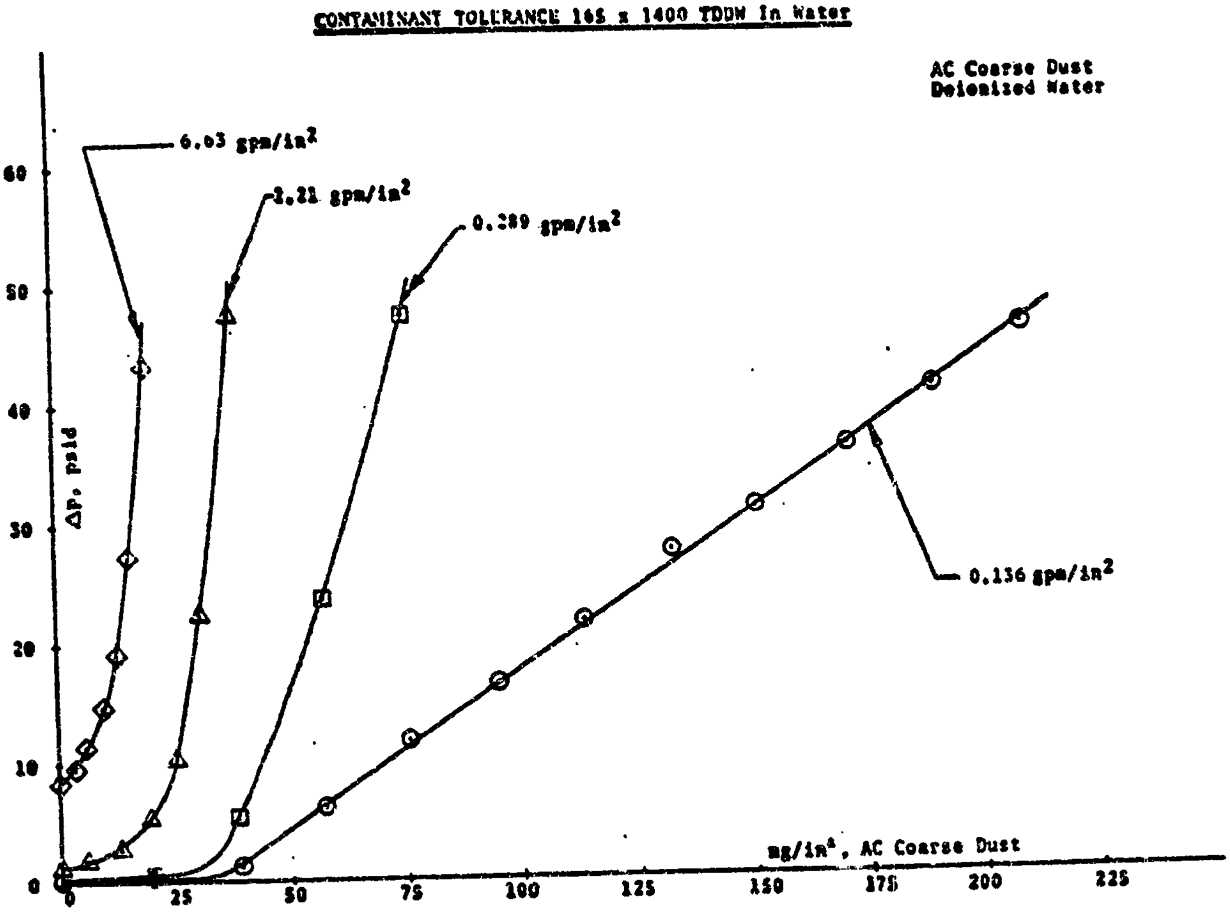

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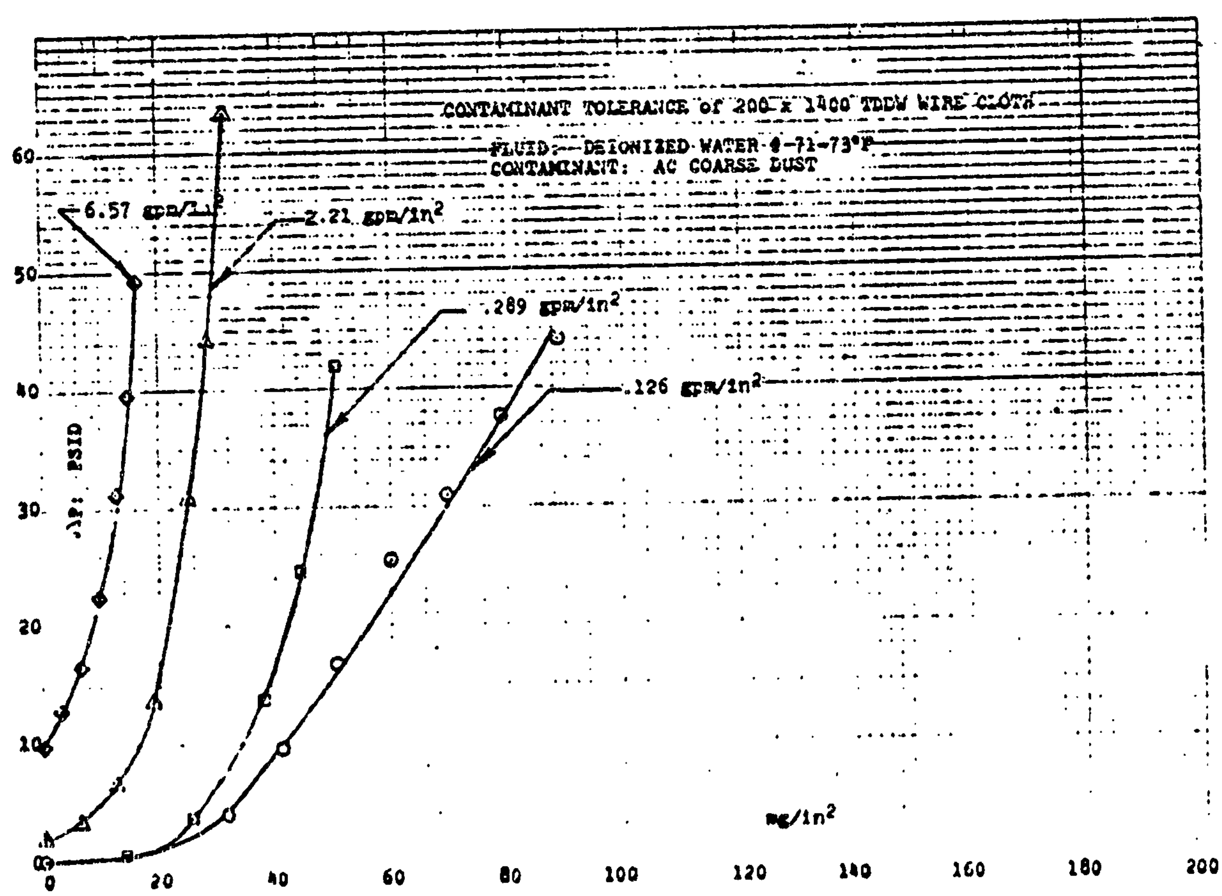

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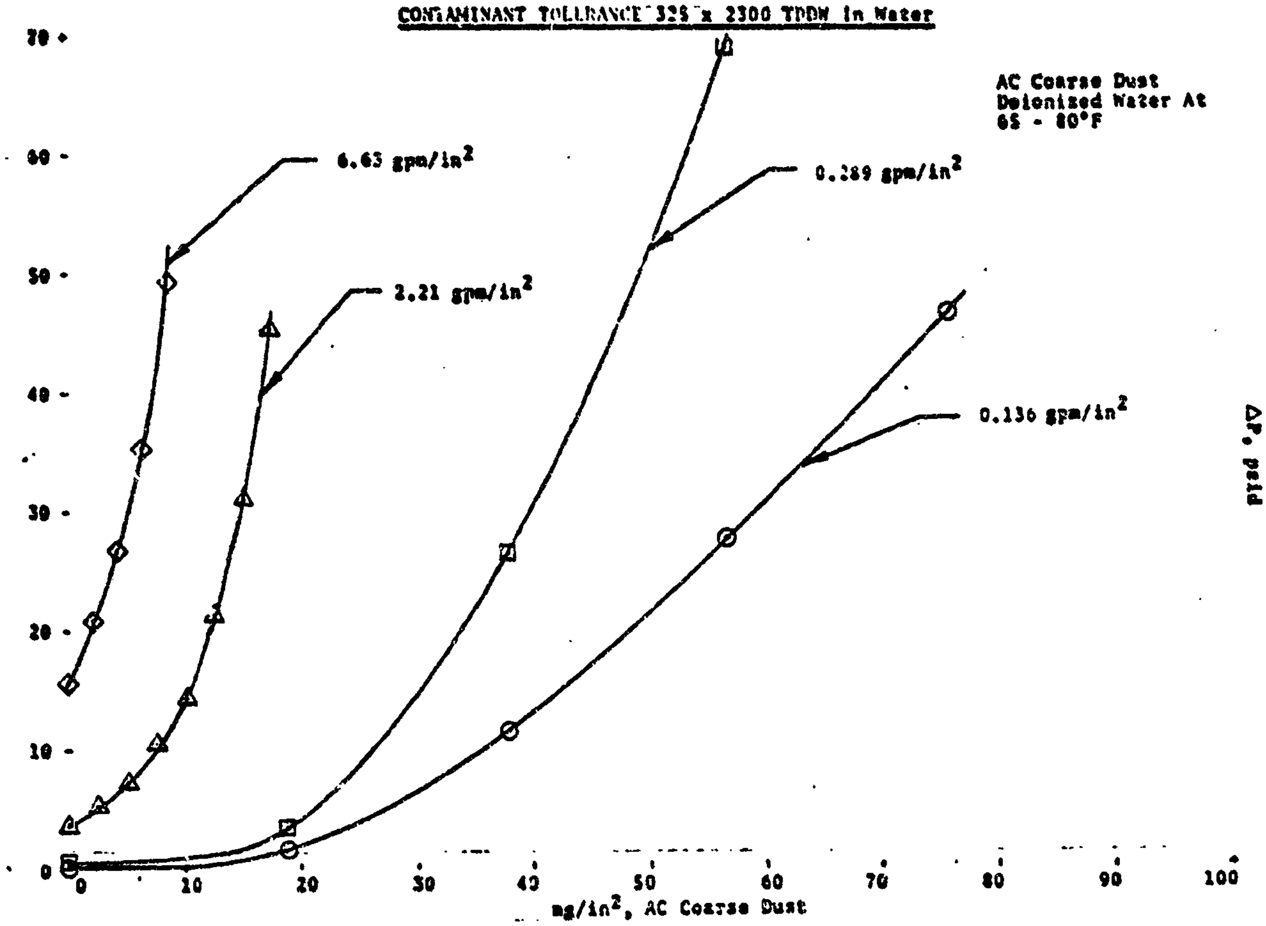

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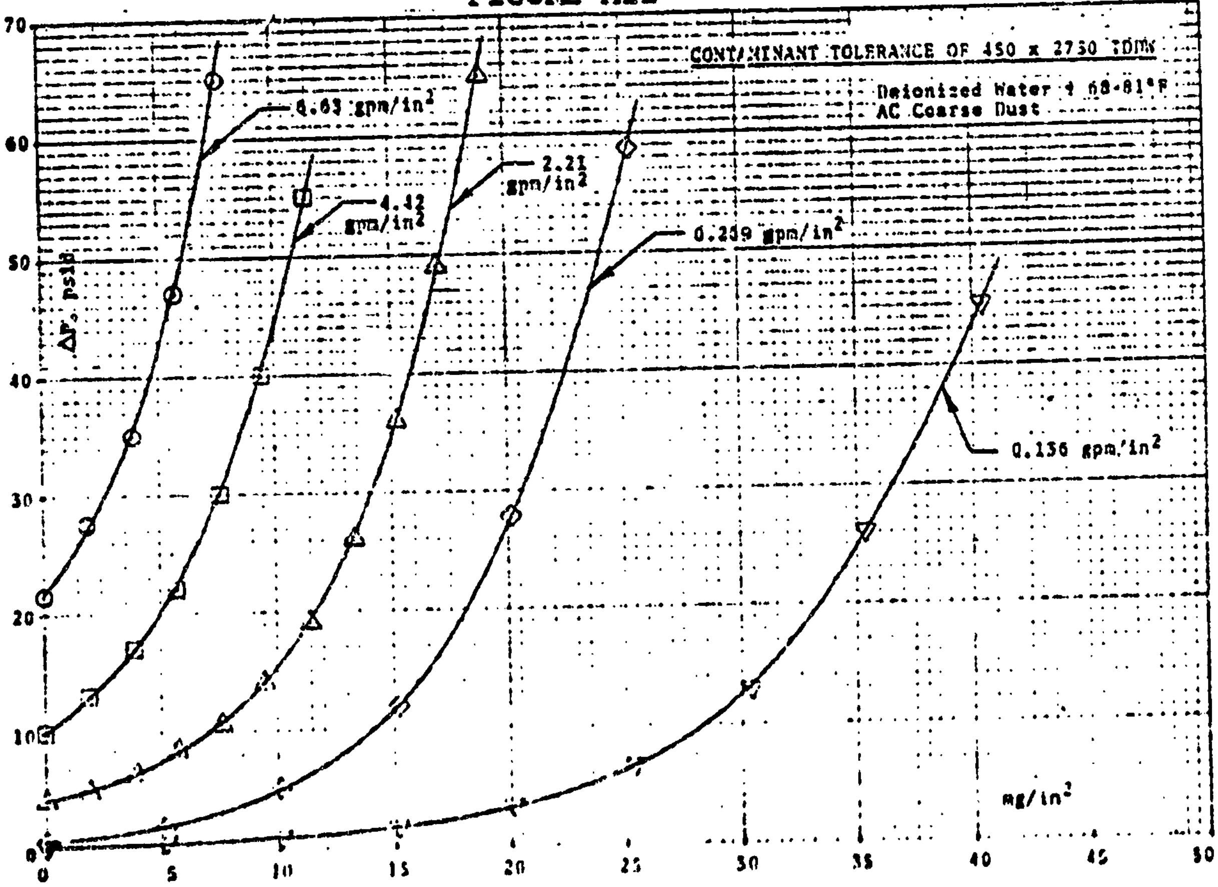

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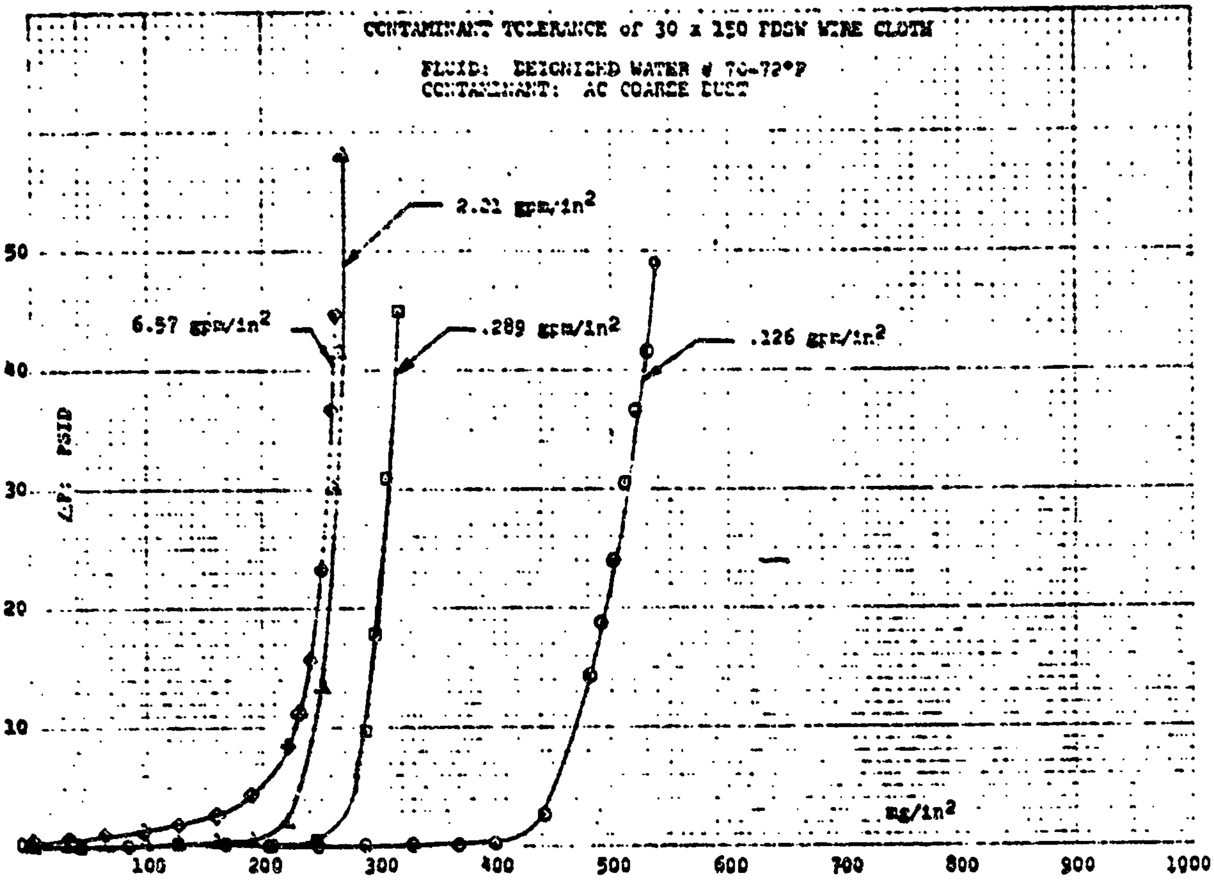

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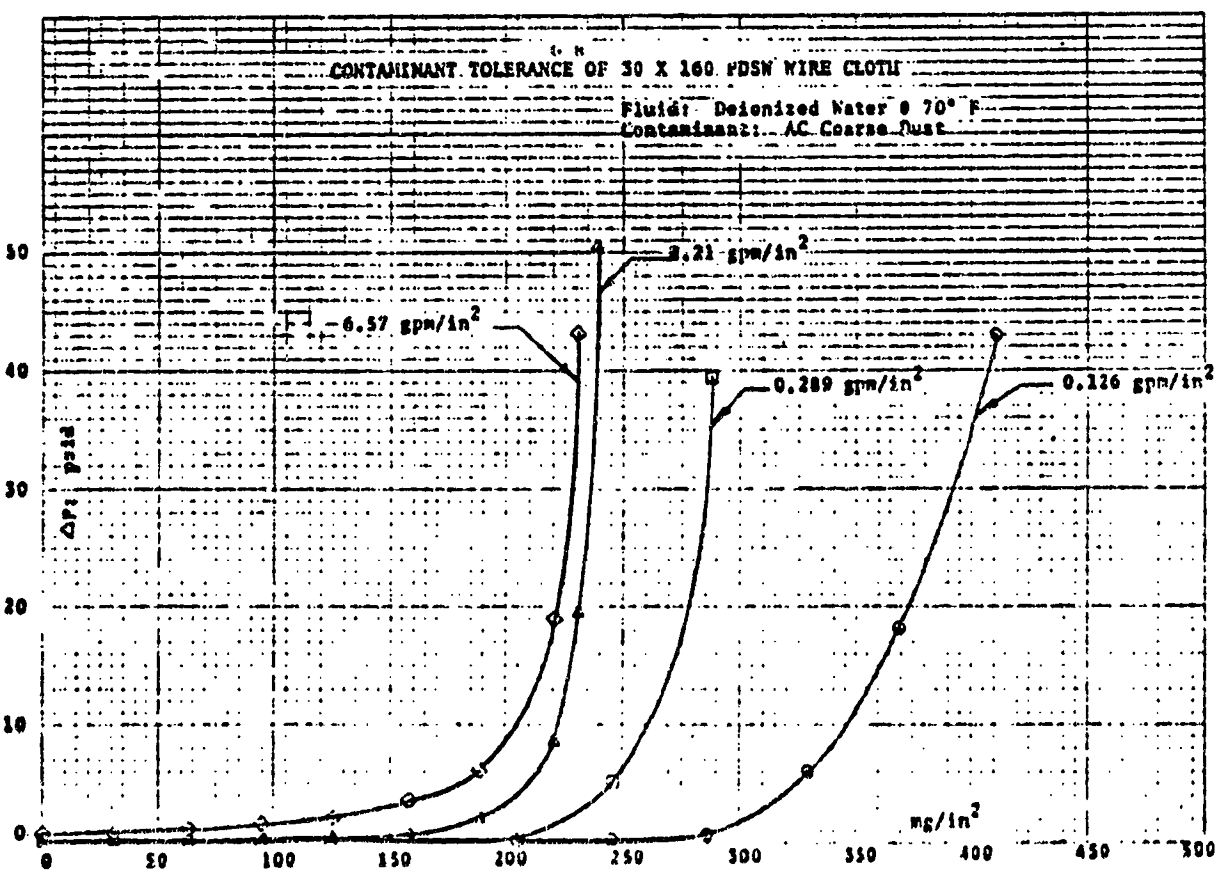

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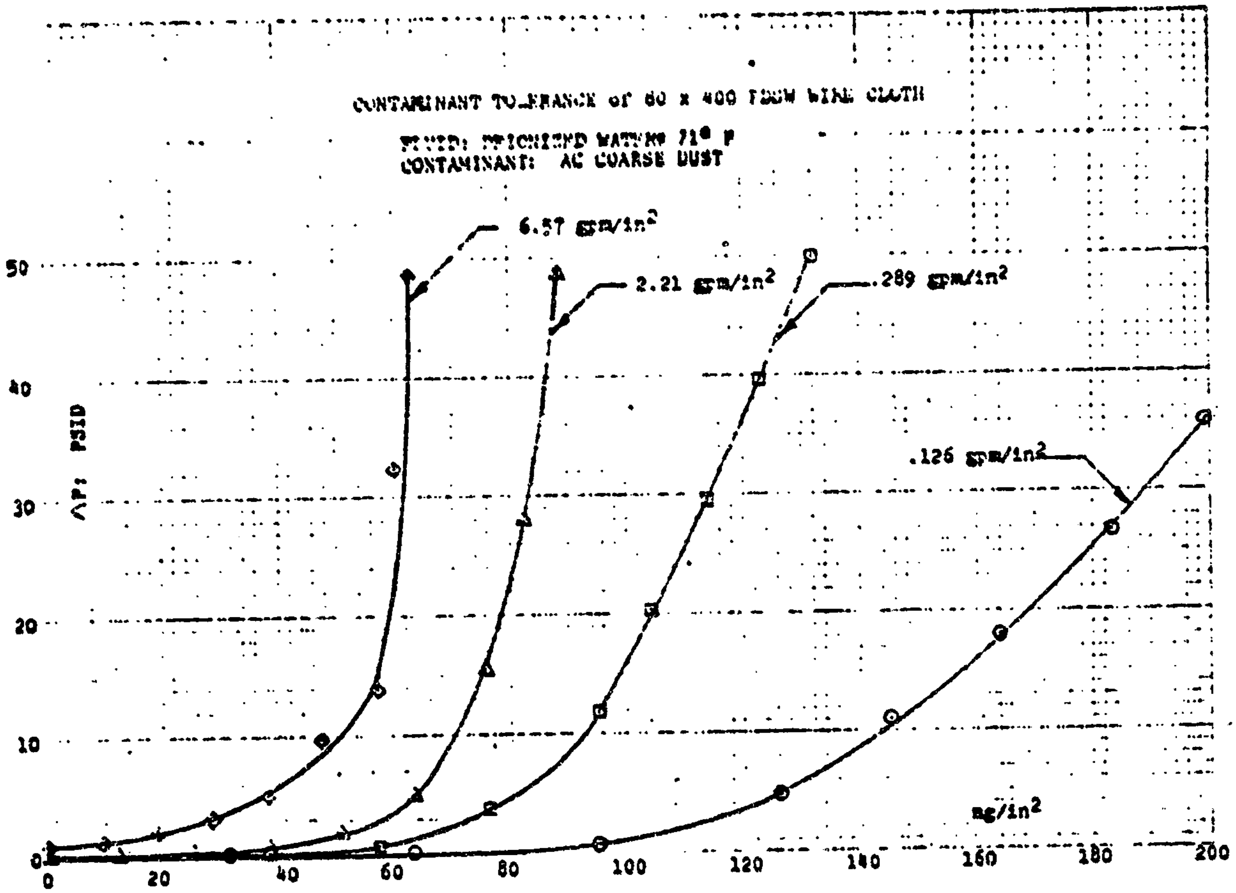
FIGURE A14



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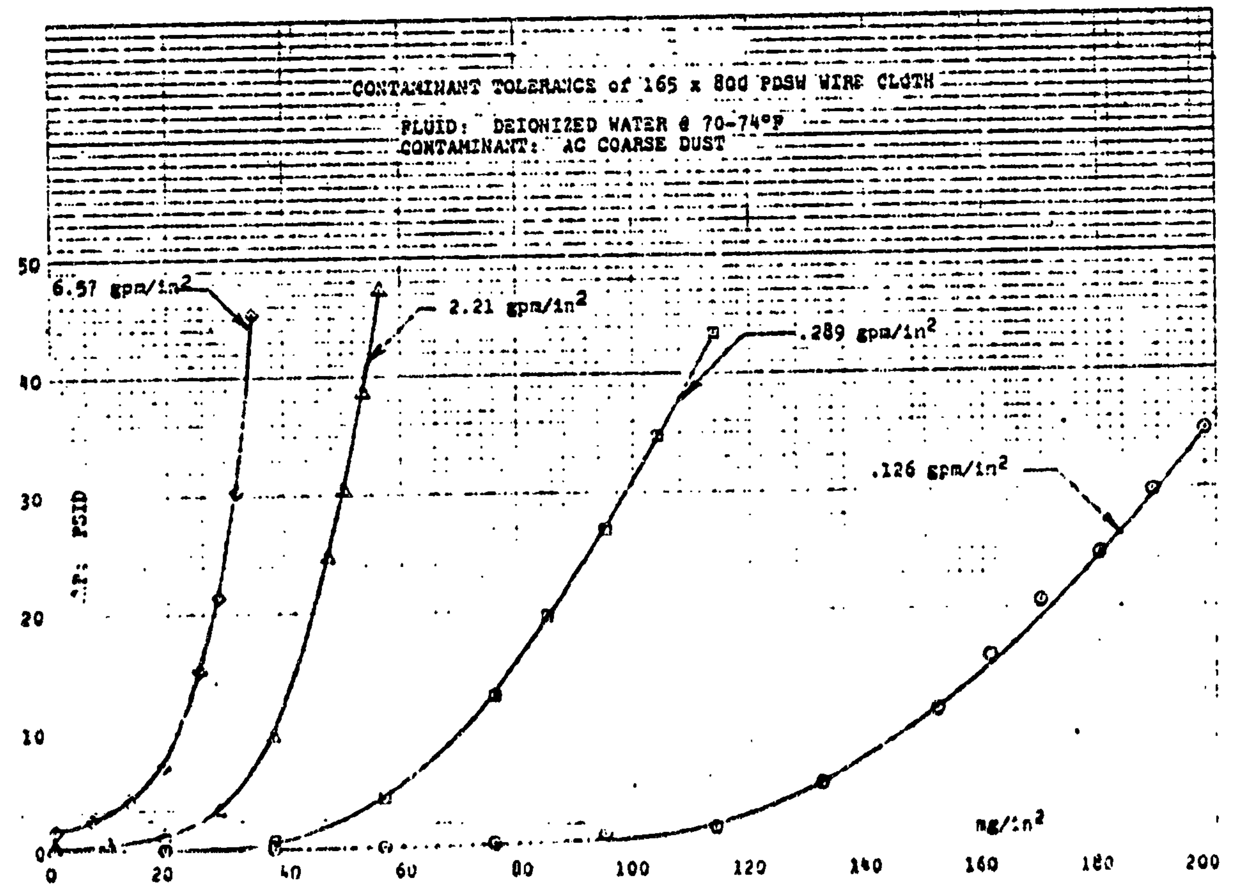

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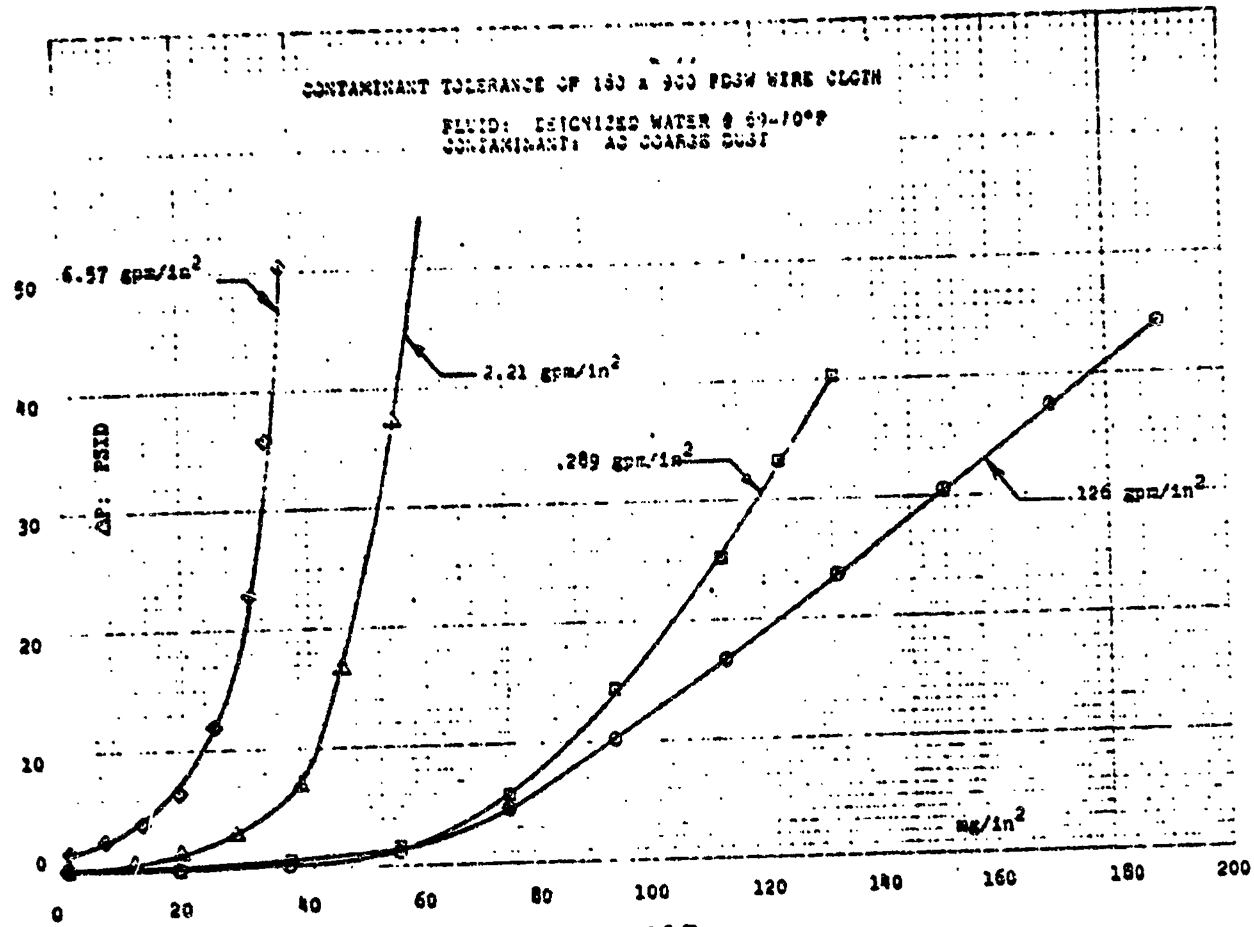

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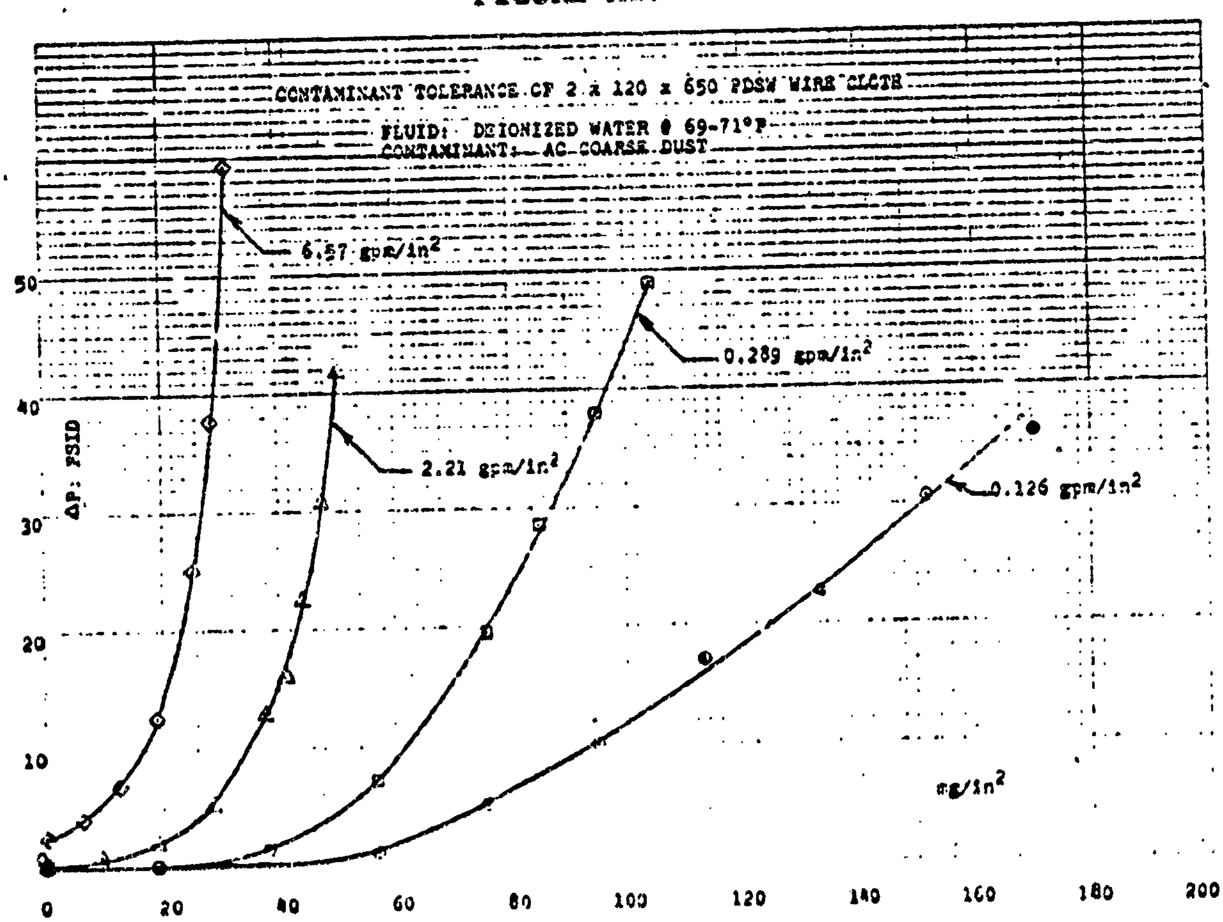

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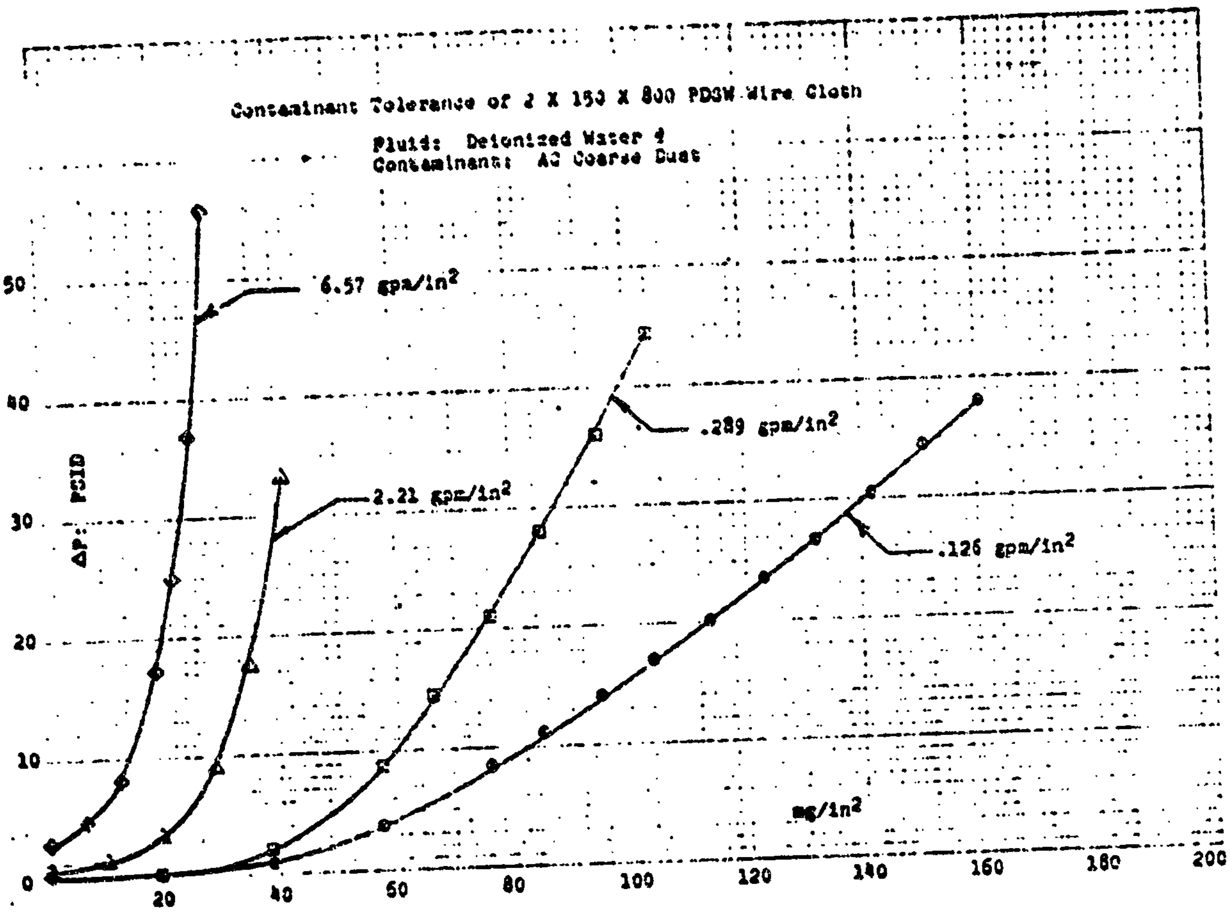

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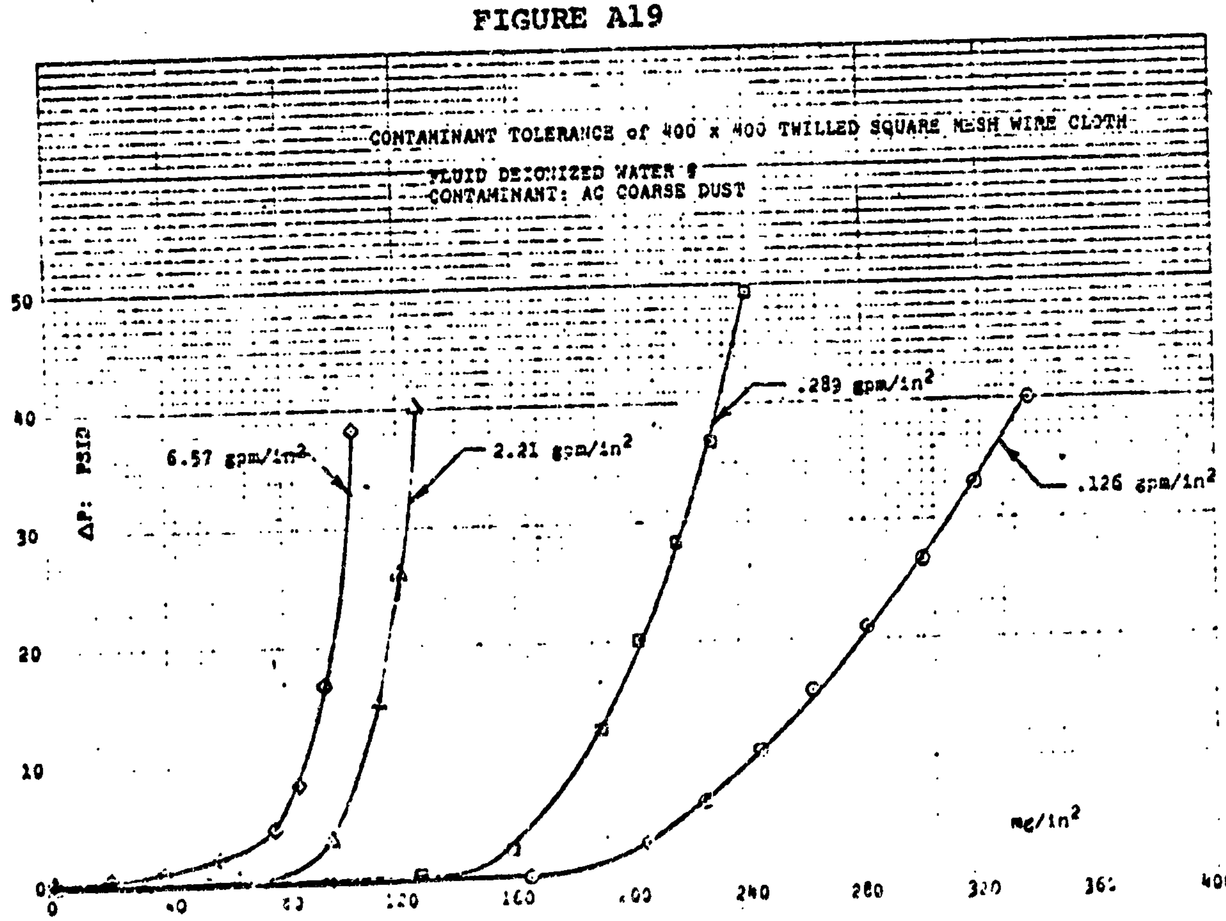

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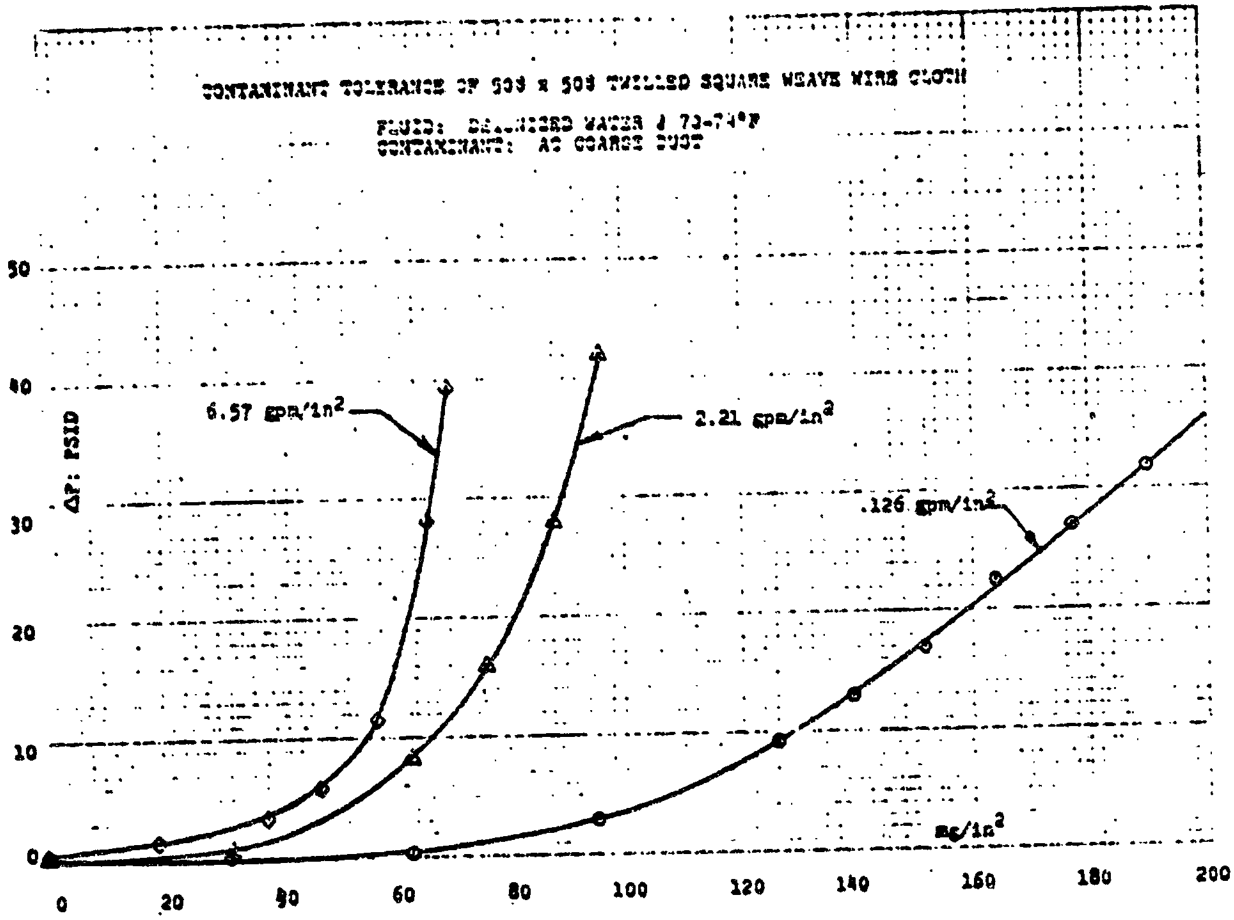

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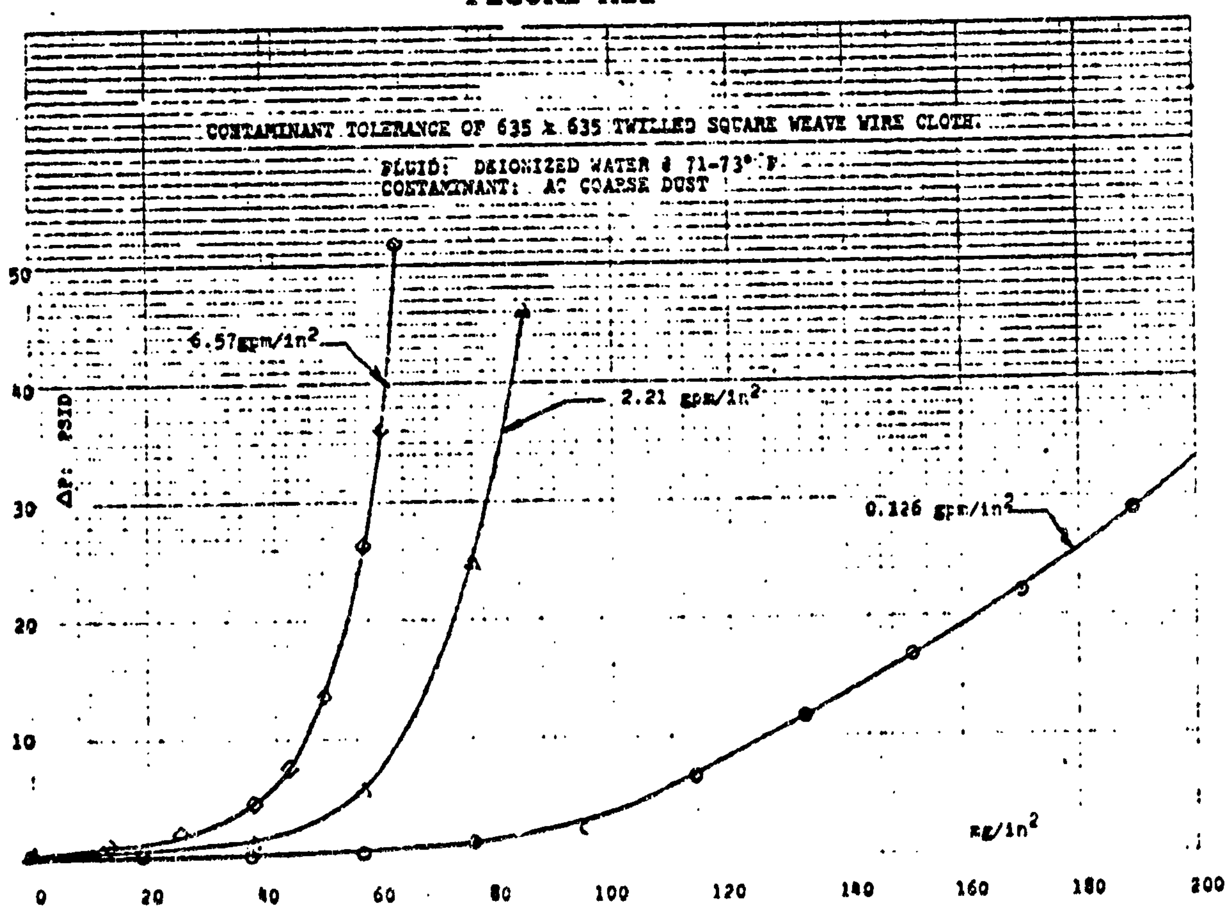

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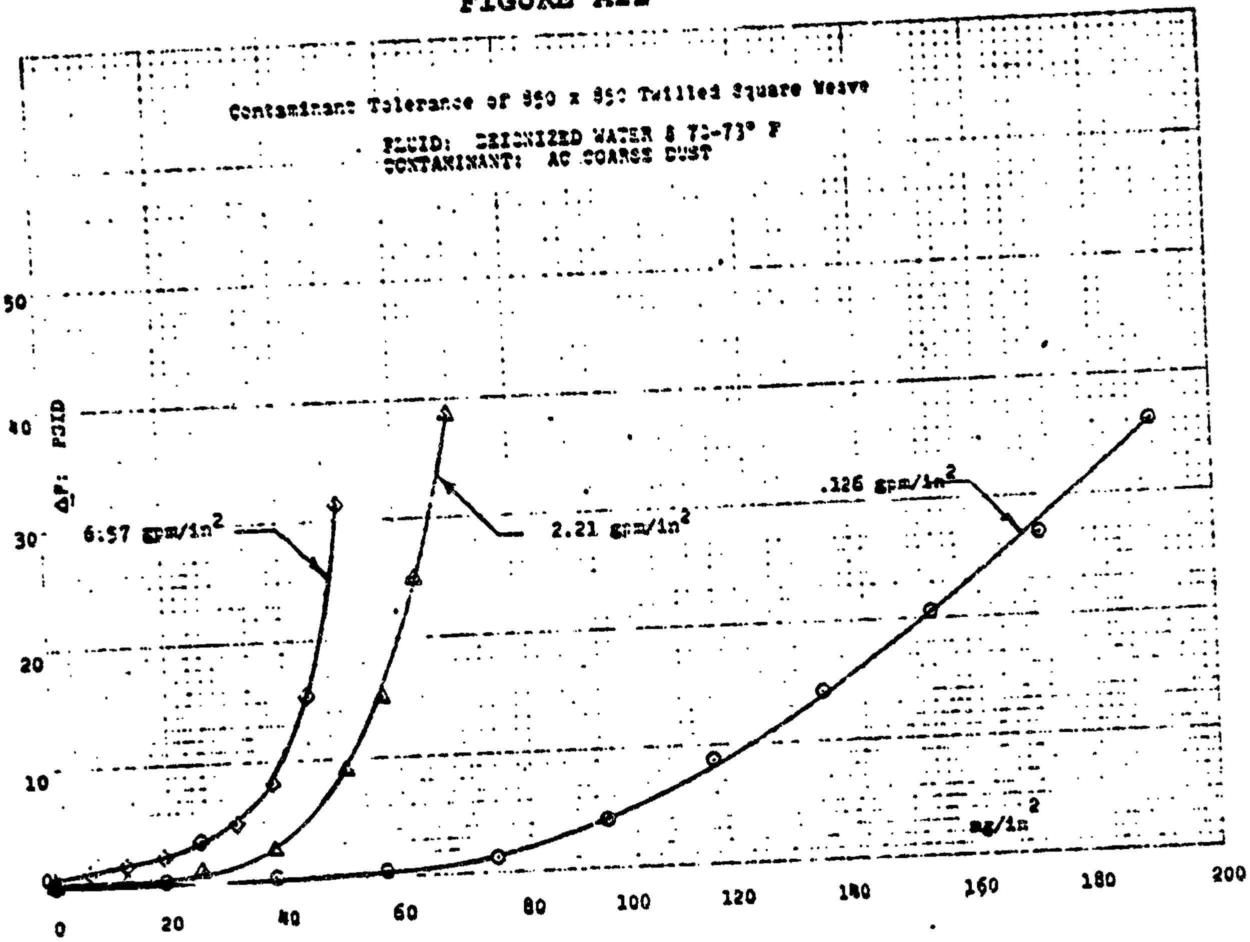

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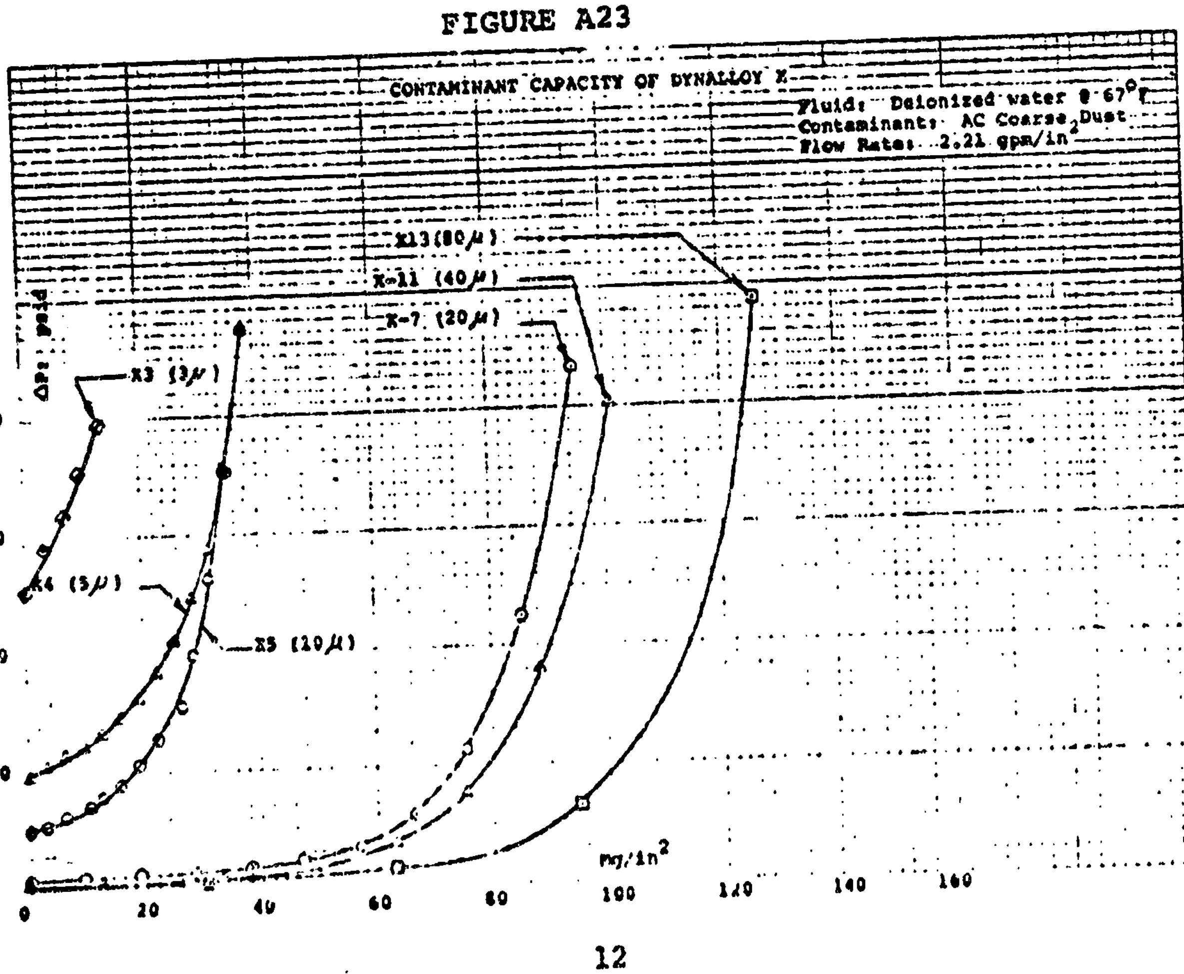

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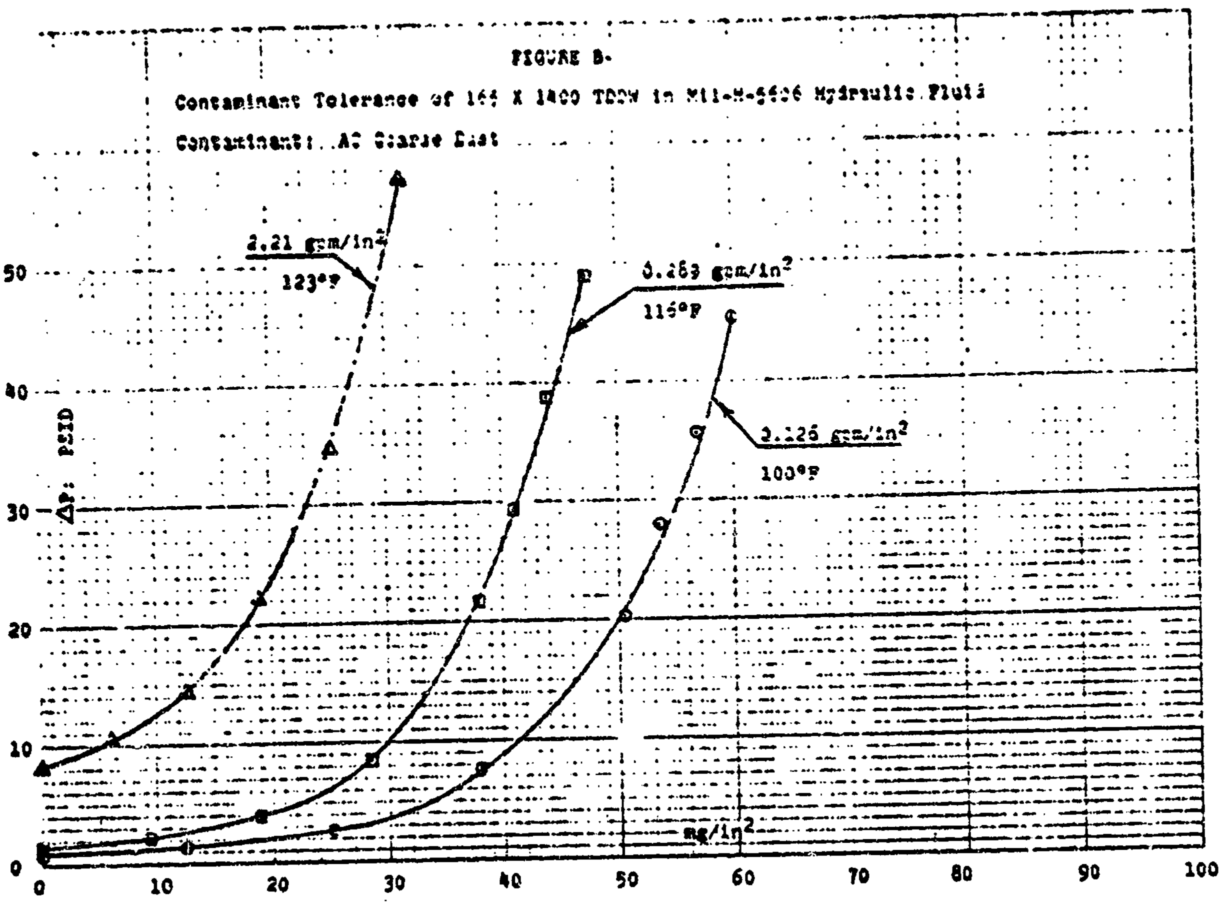
FIGURE A24



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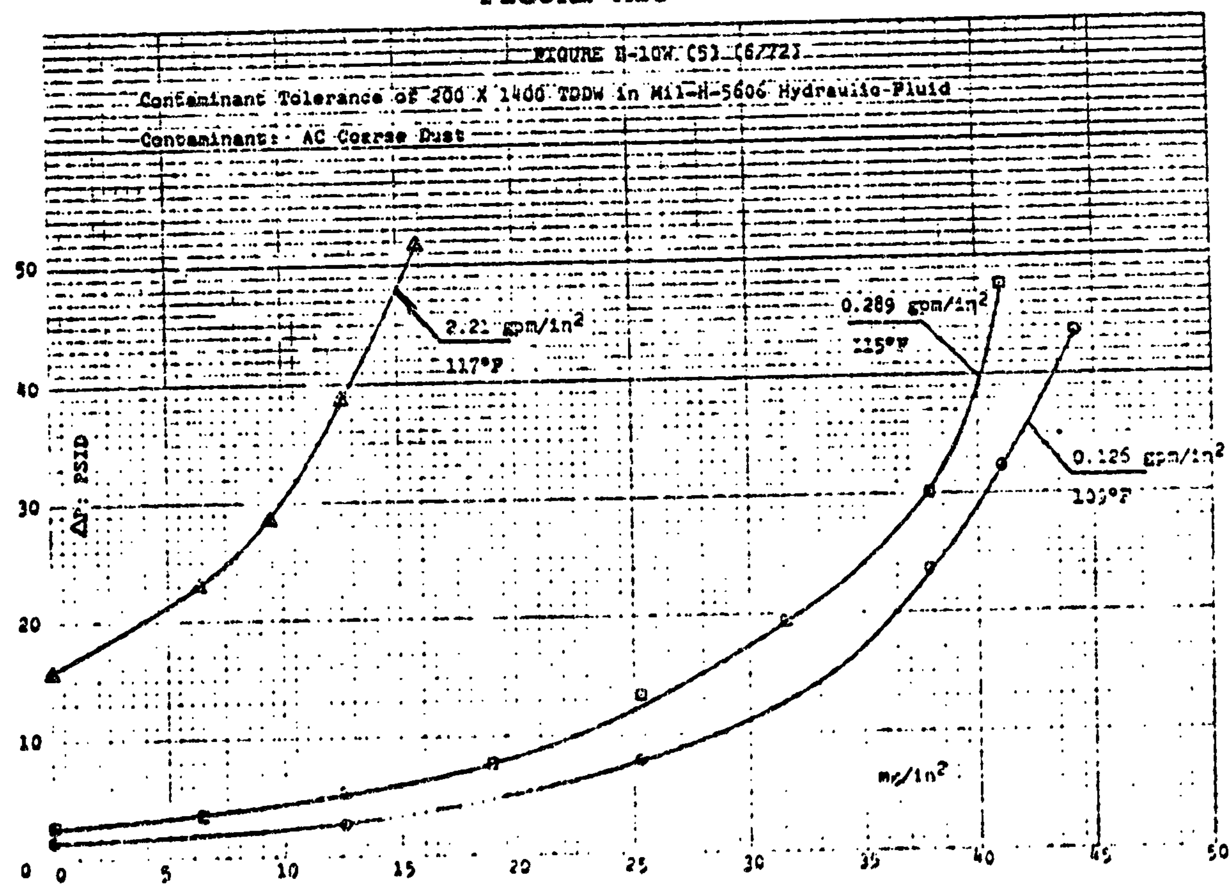

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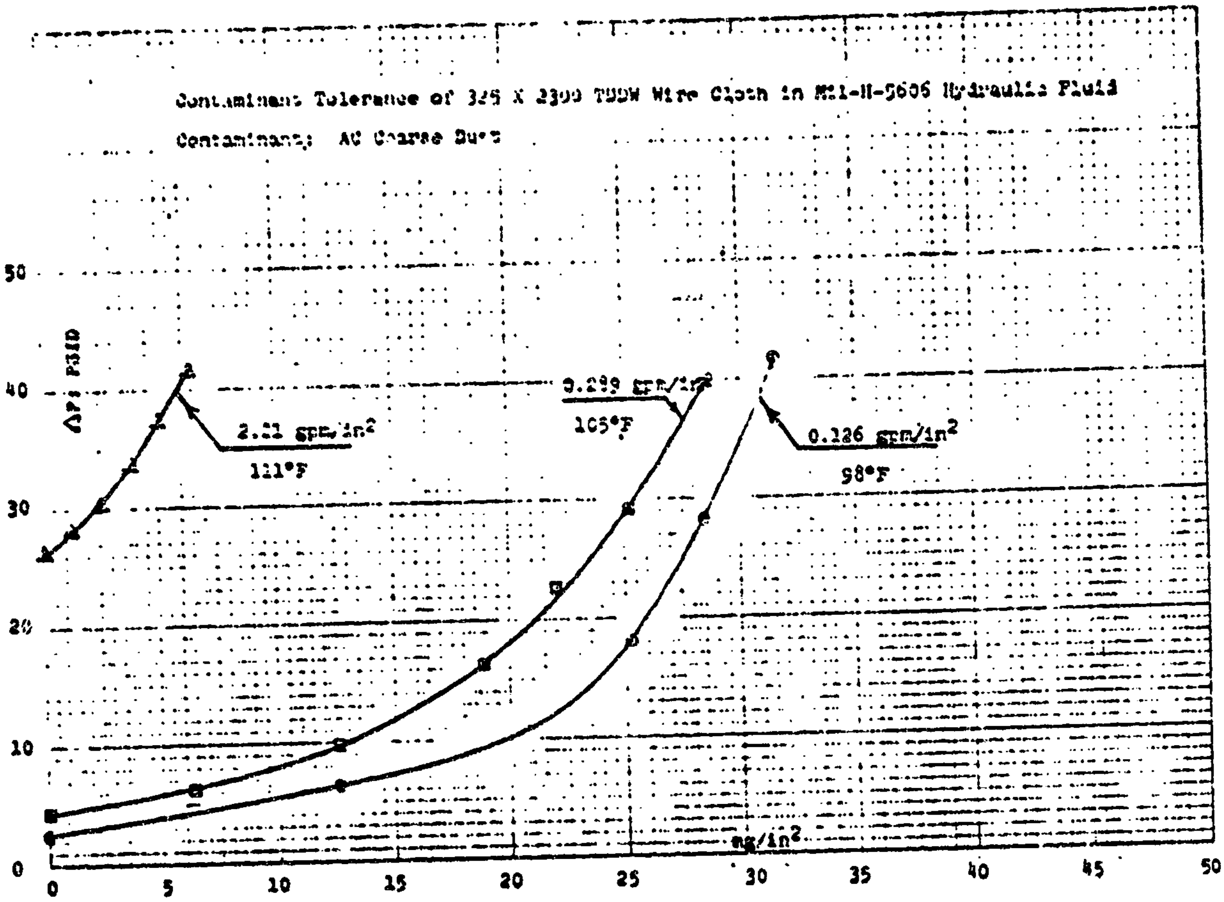

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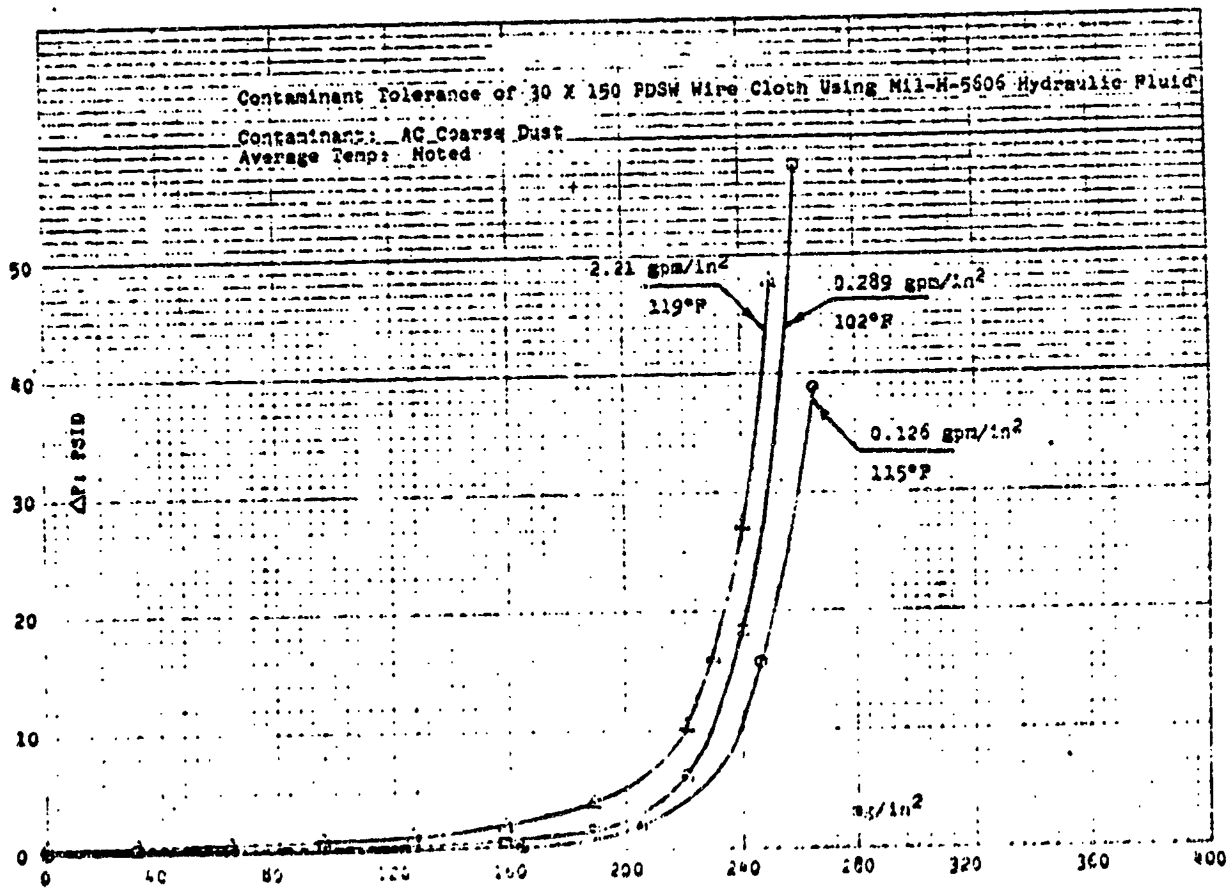

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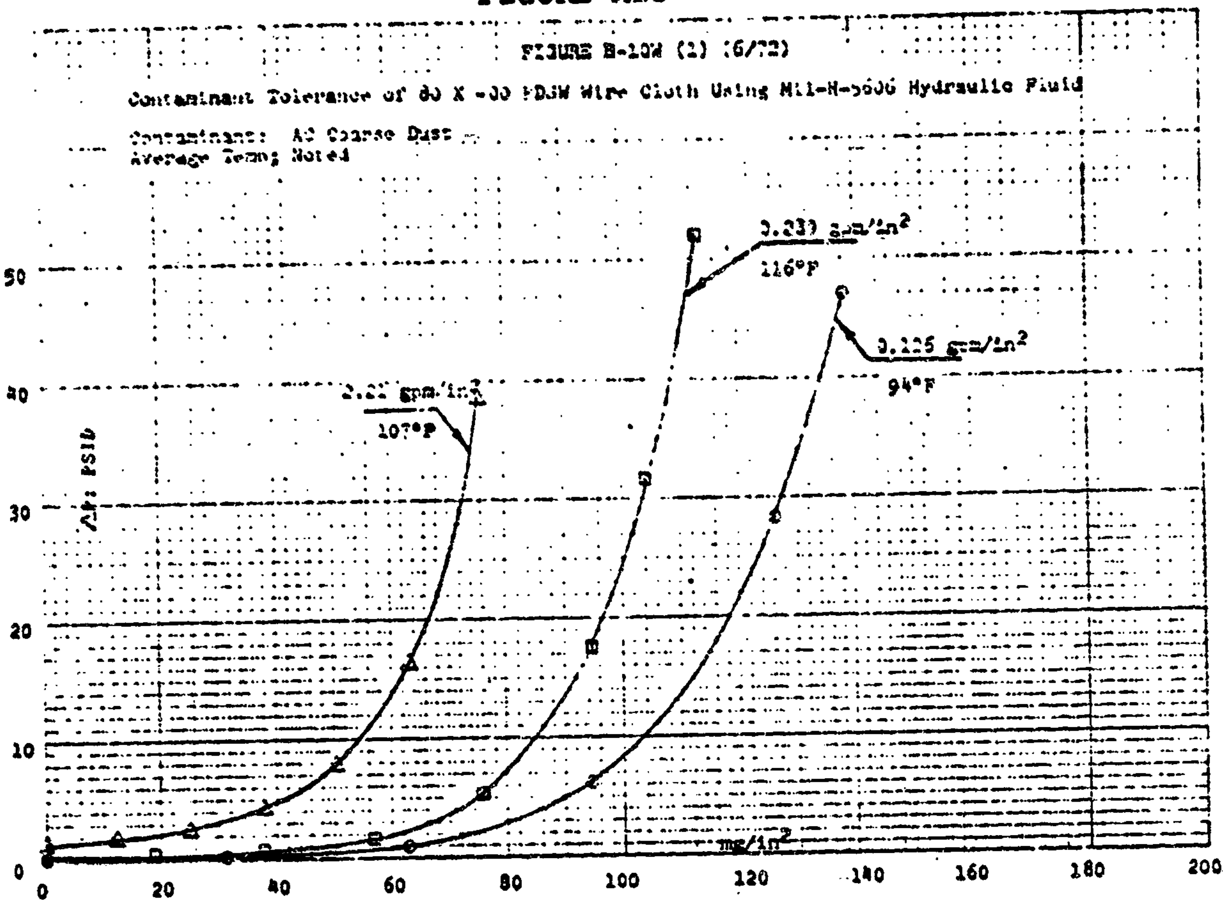

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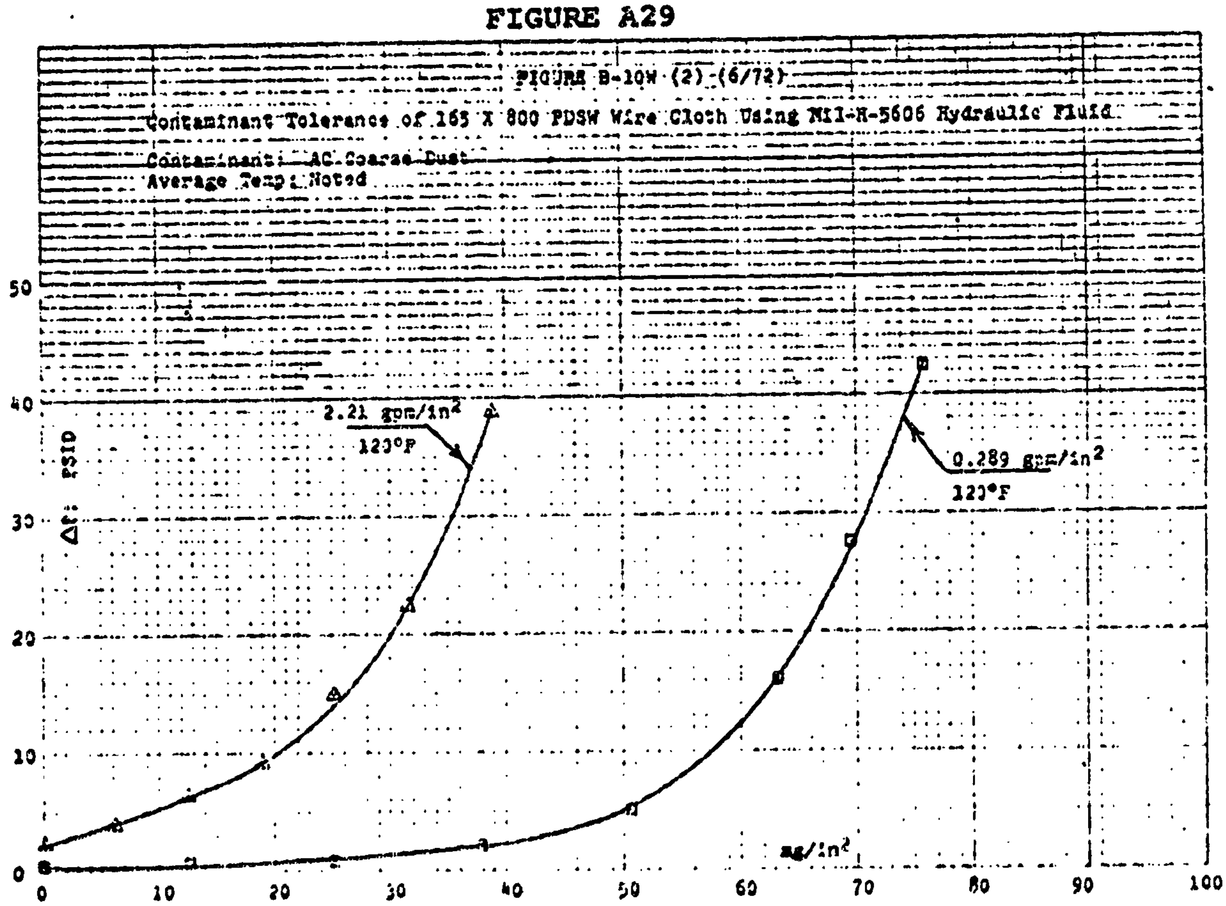

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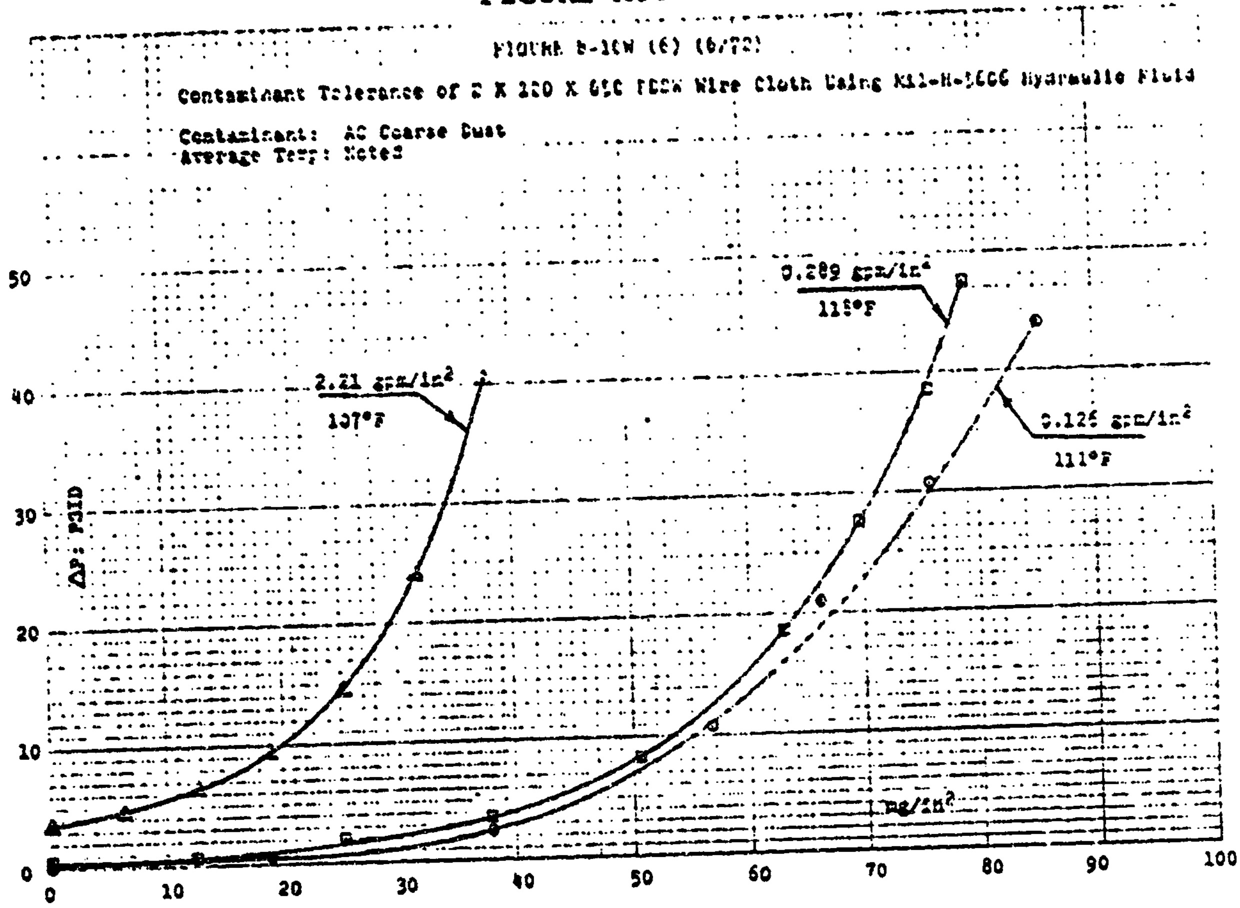

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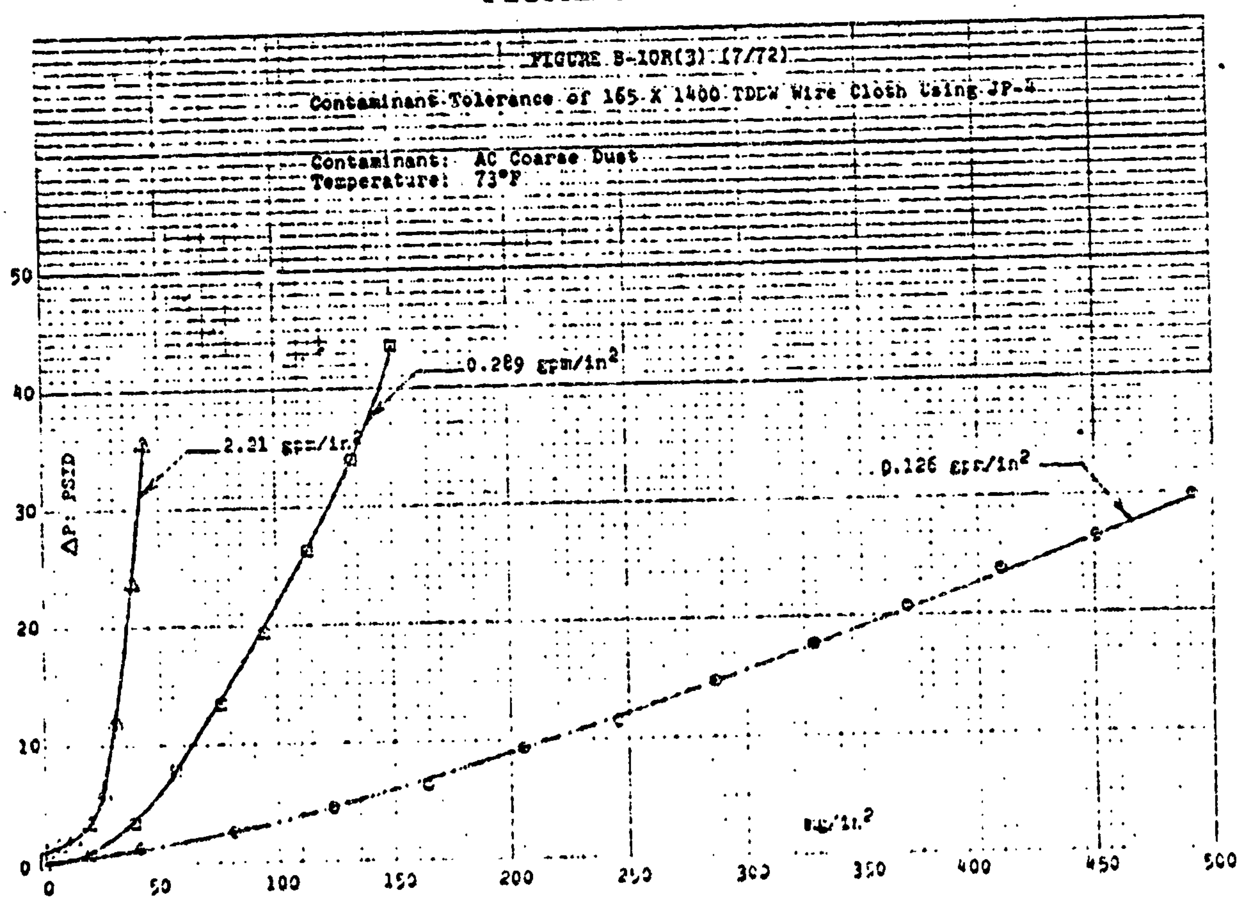
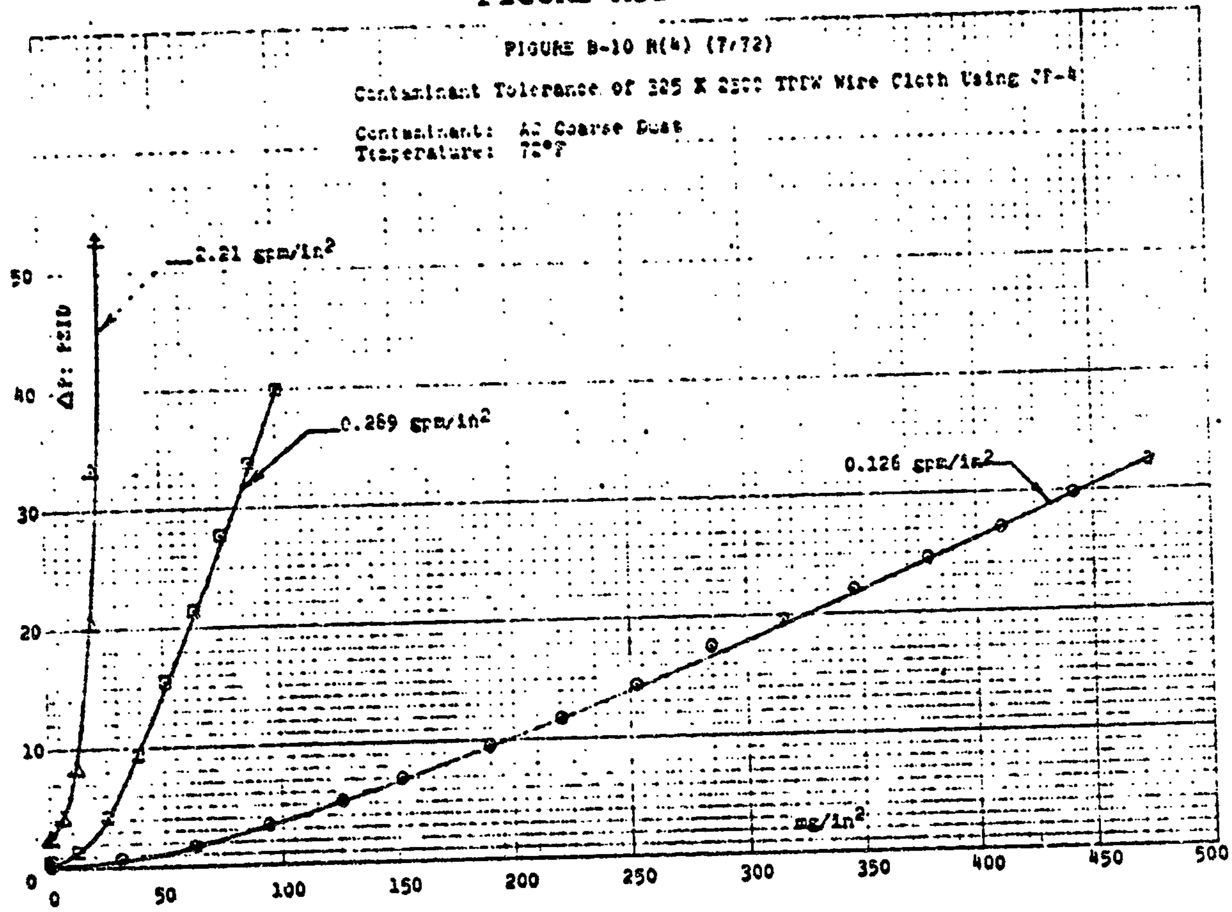


FIGURE A32



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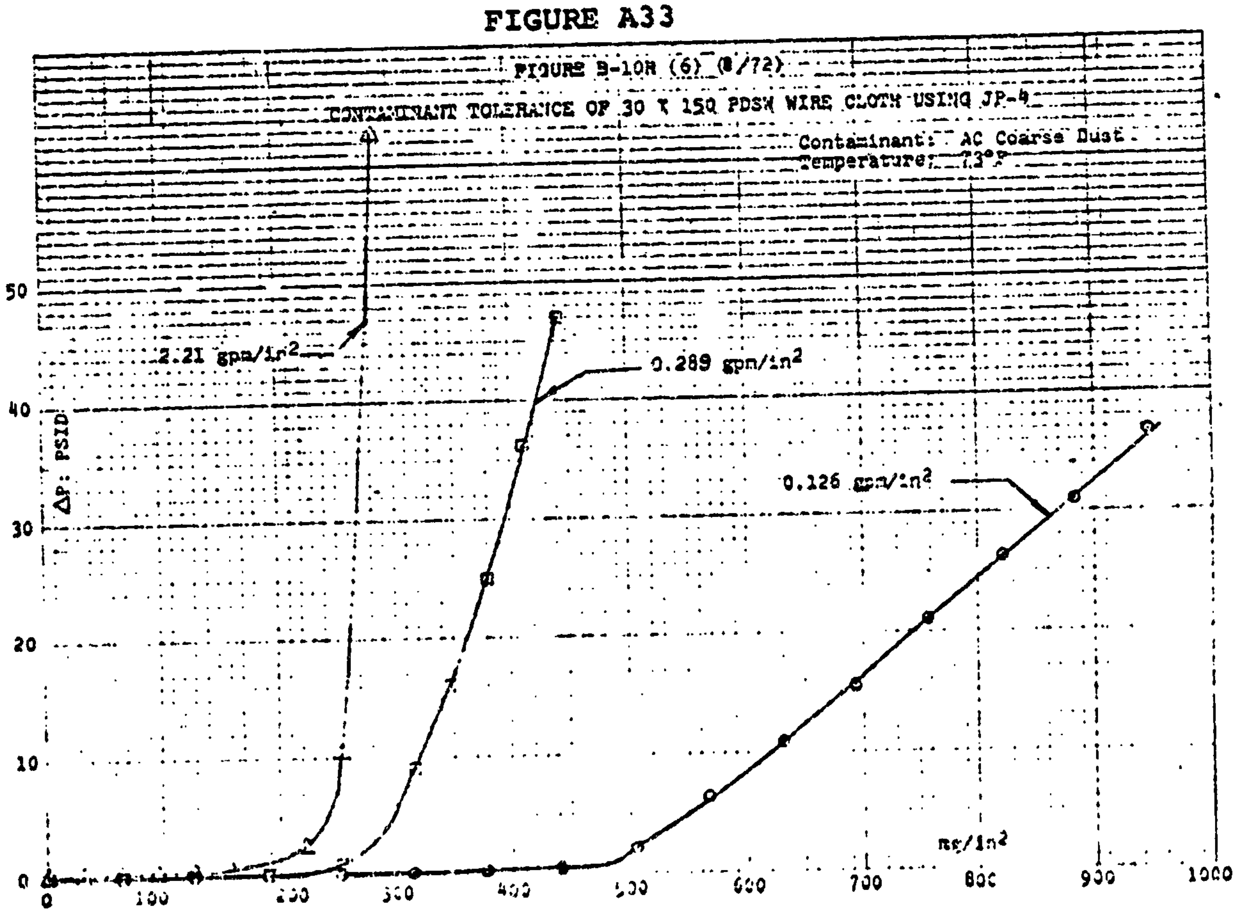

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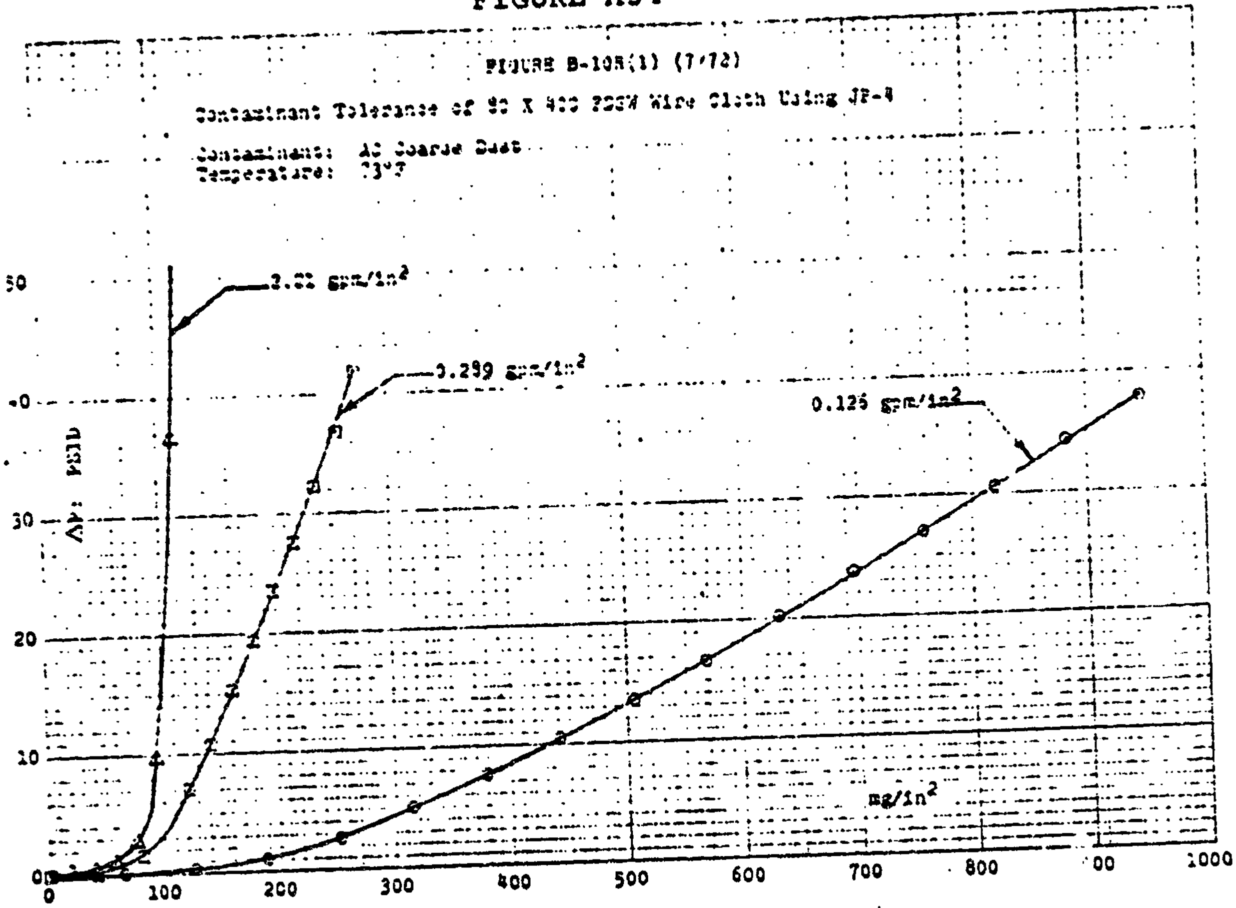

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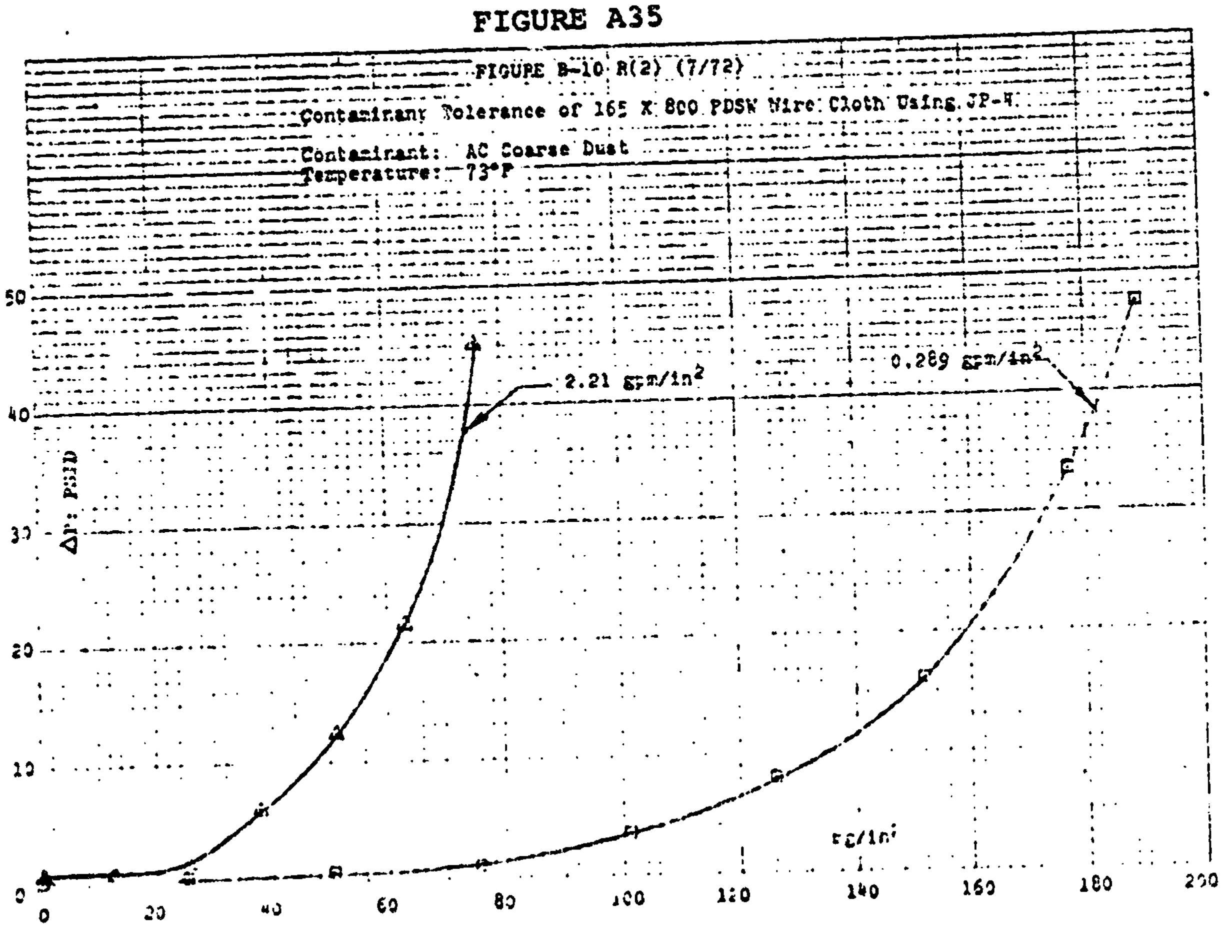

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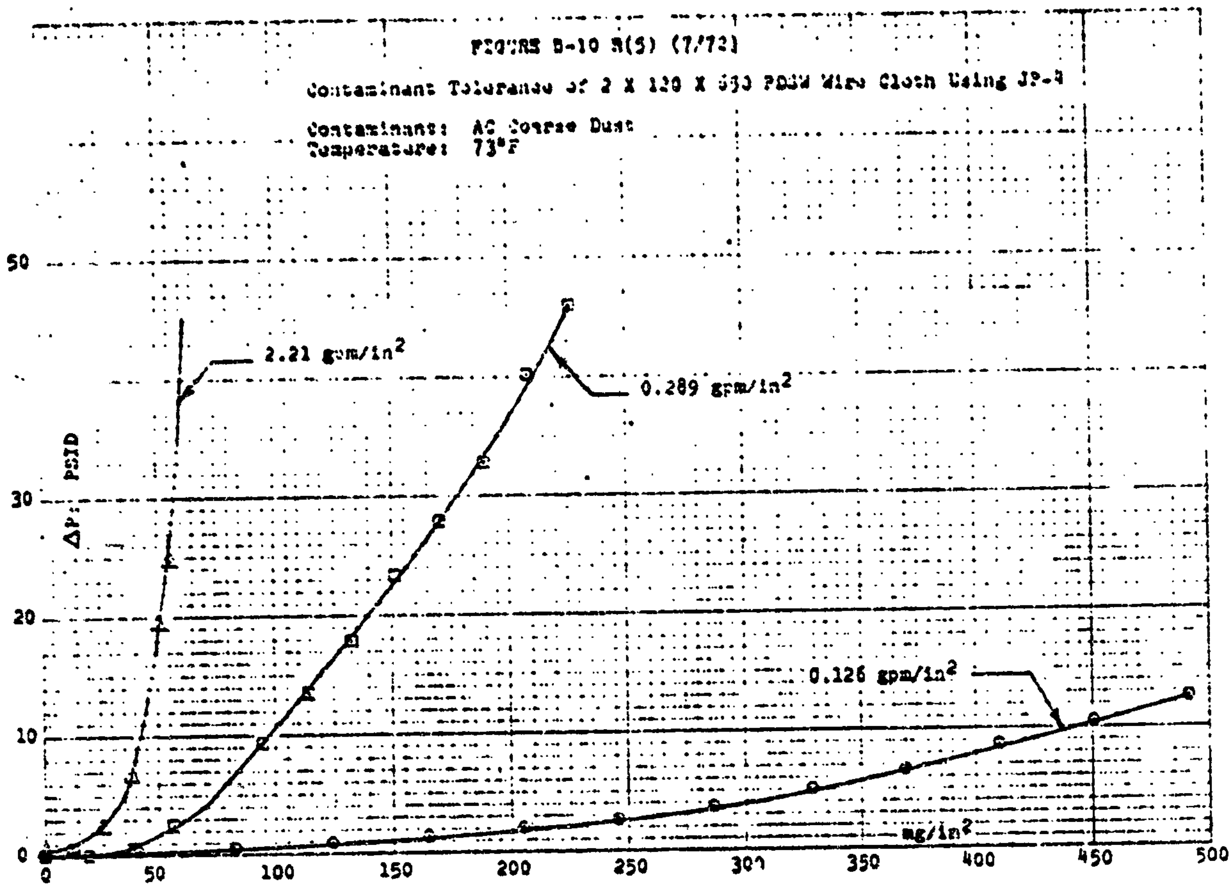

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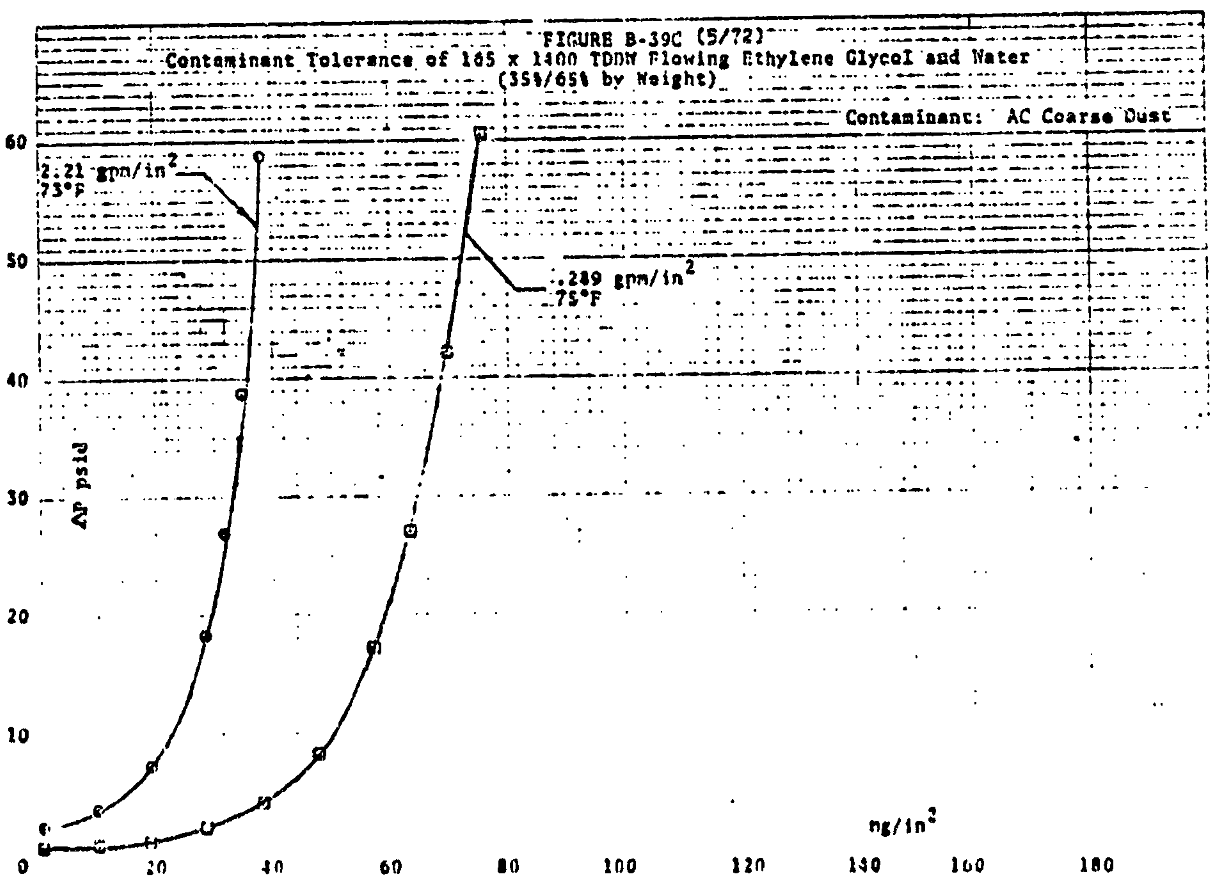

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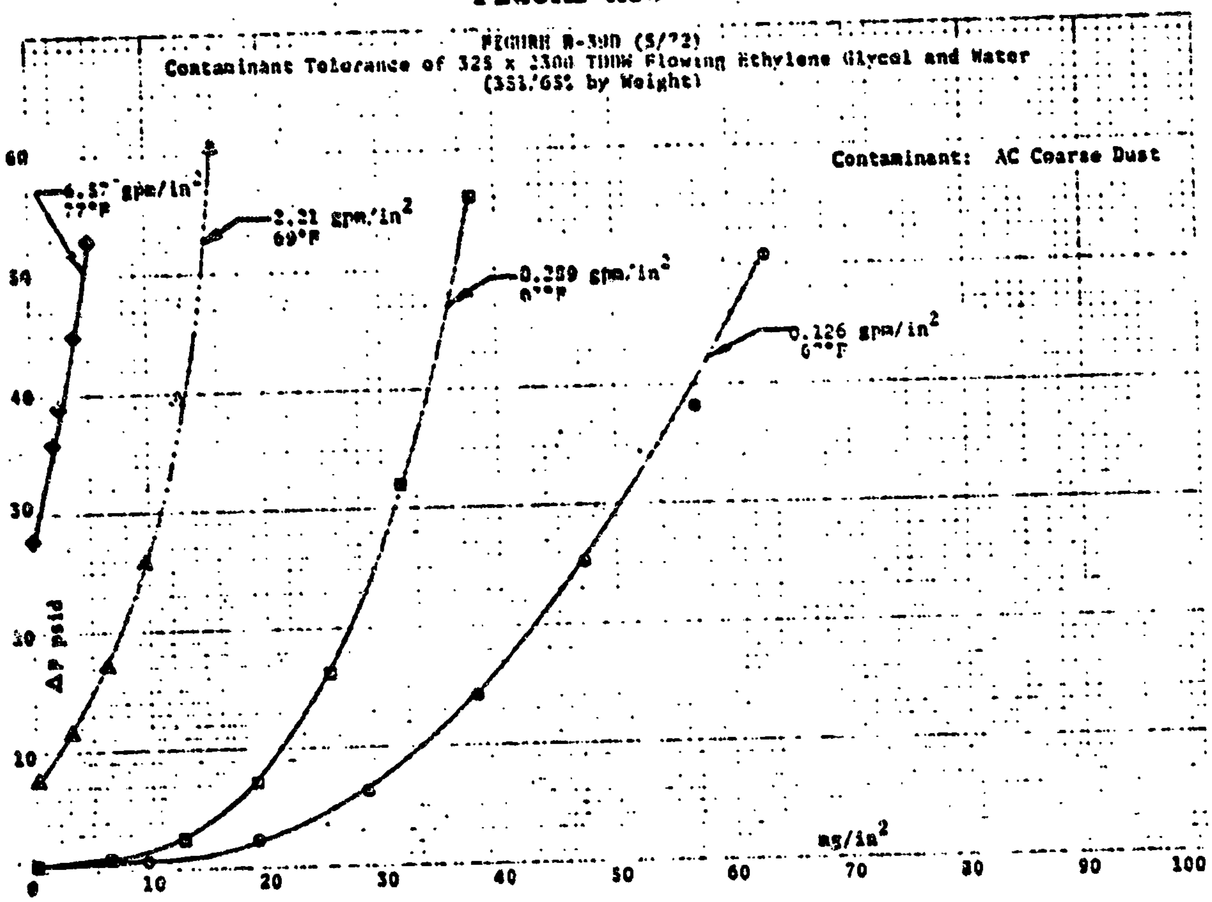

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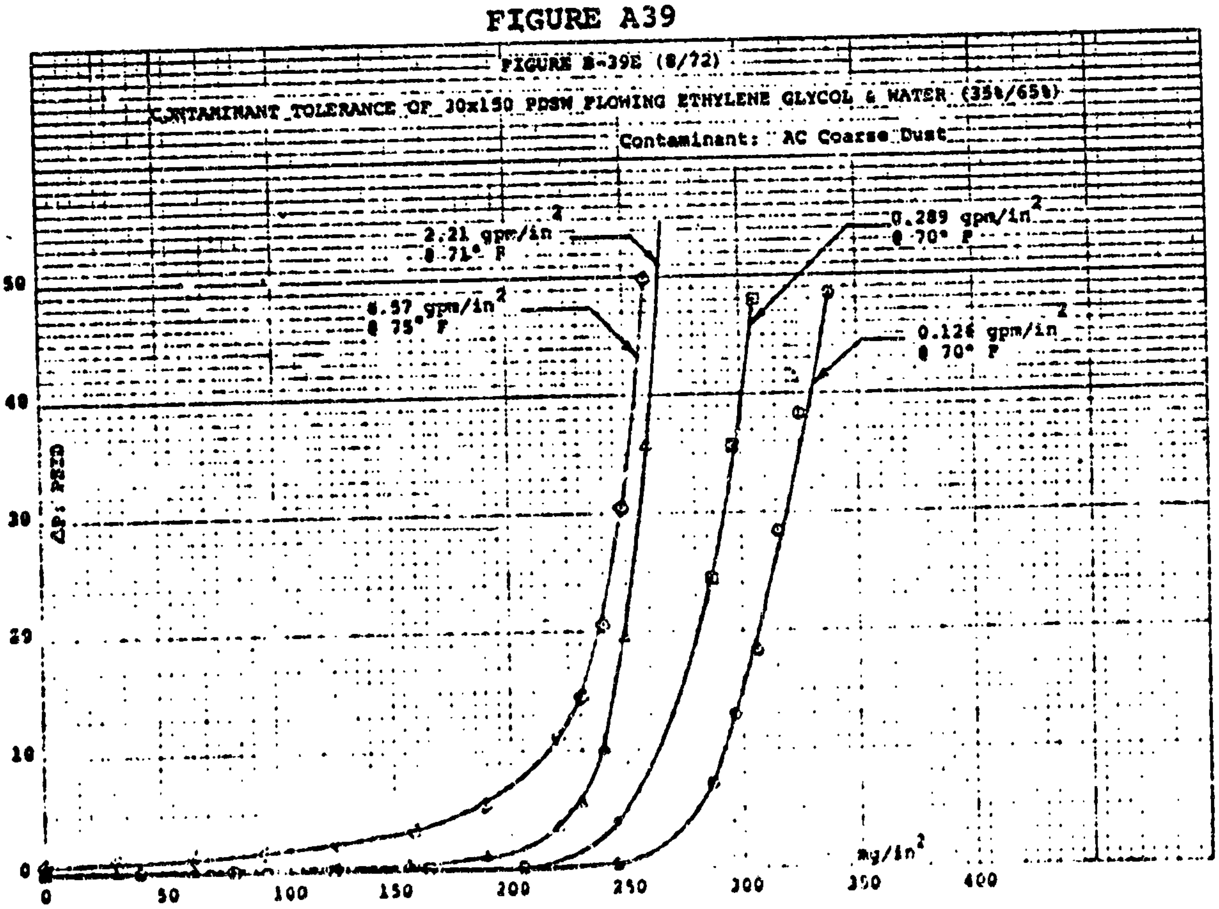

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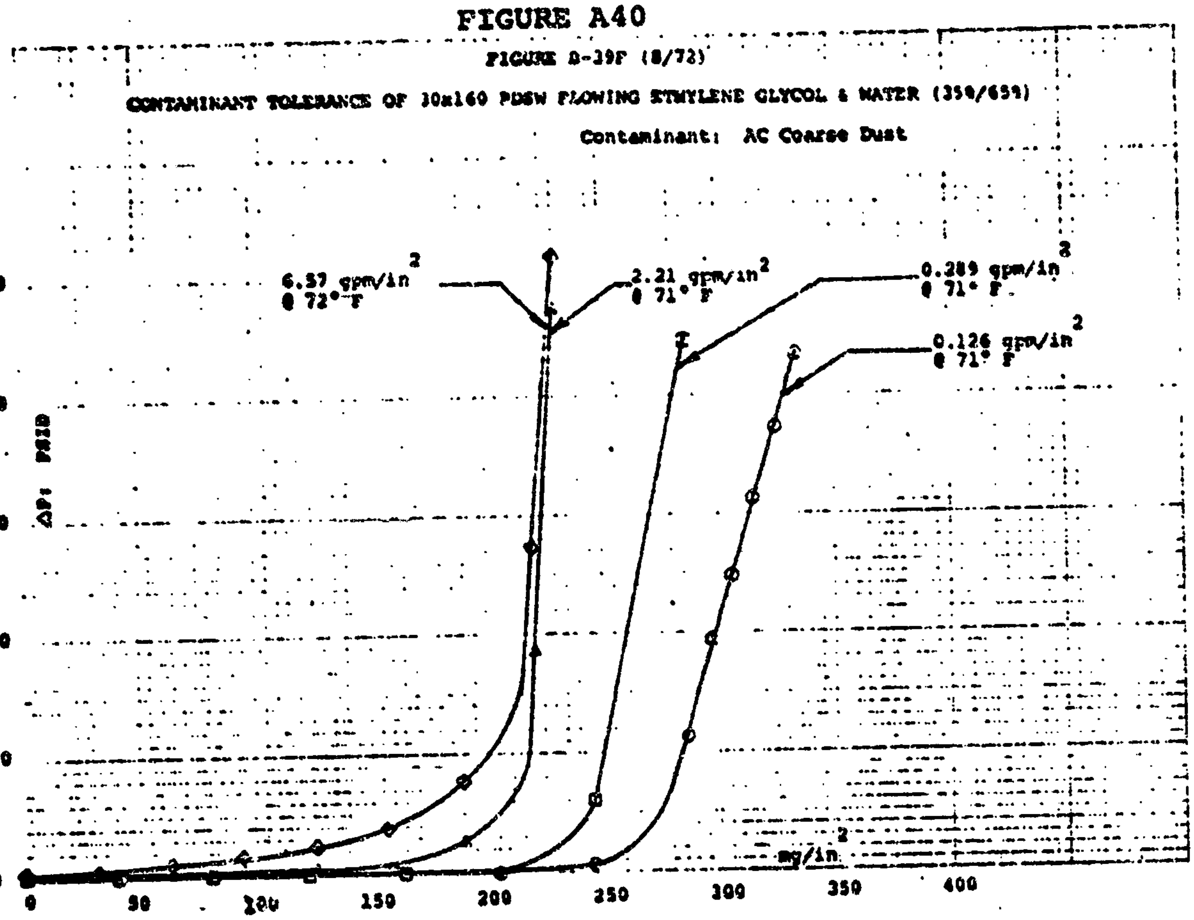

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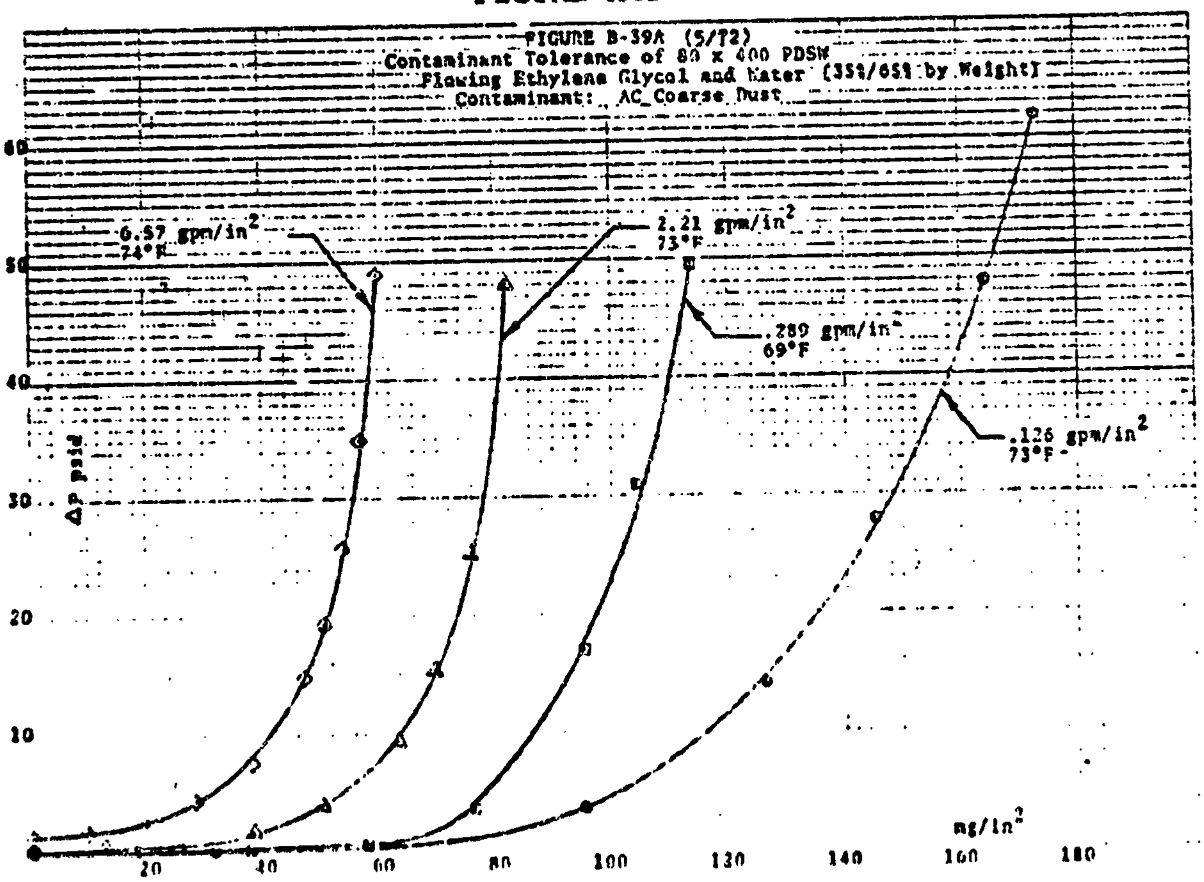

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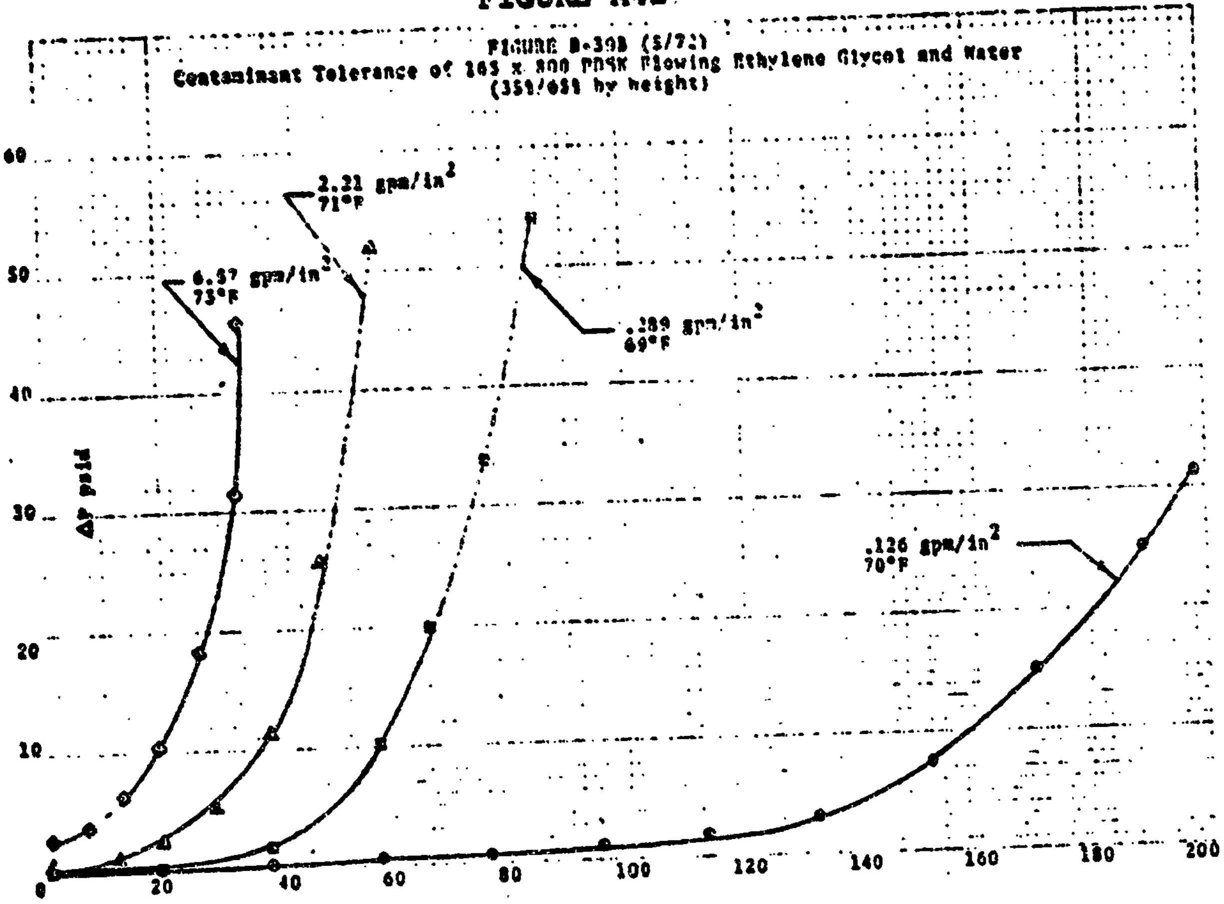

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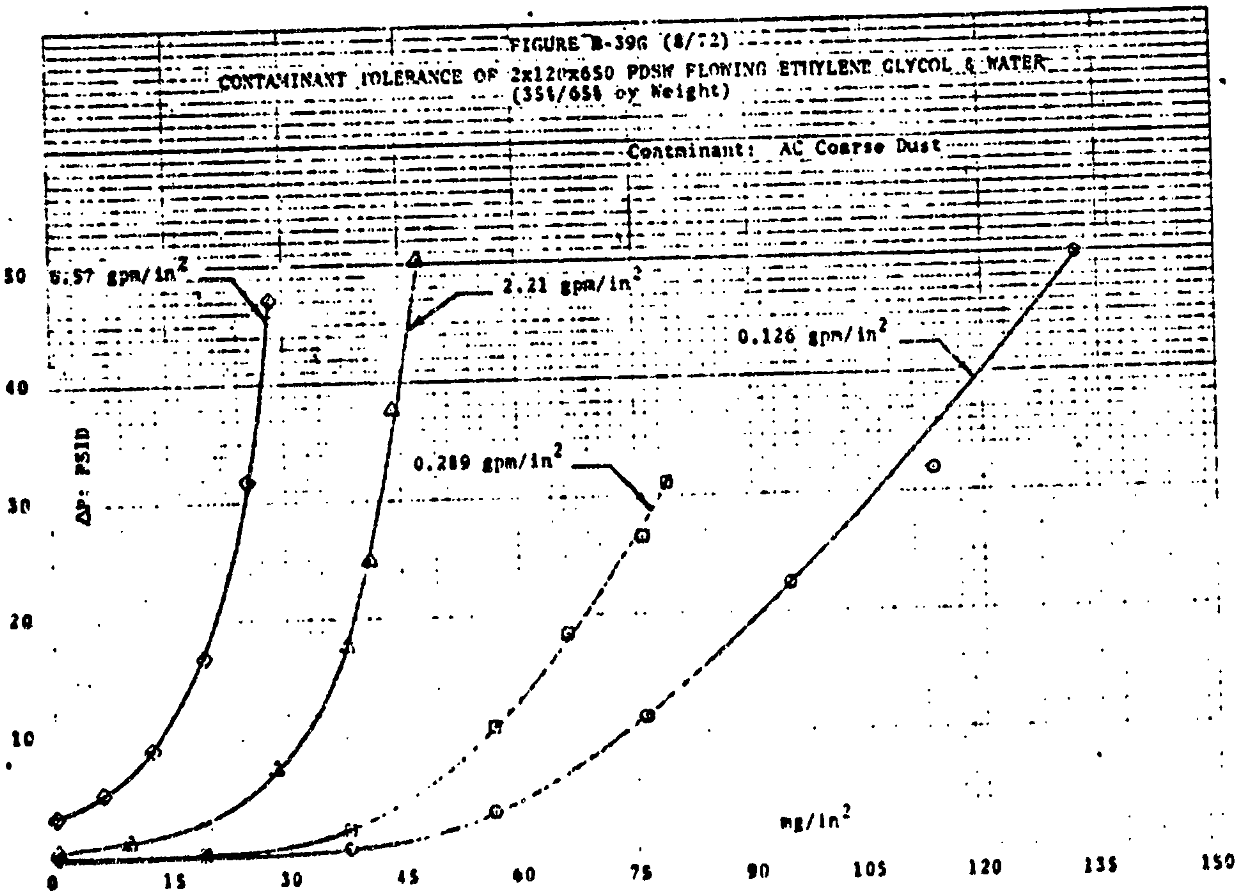

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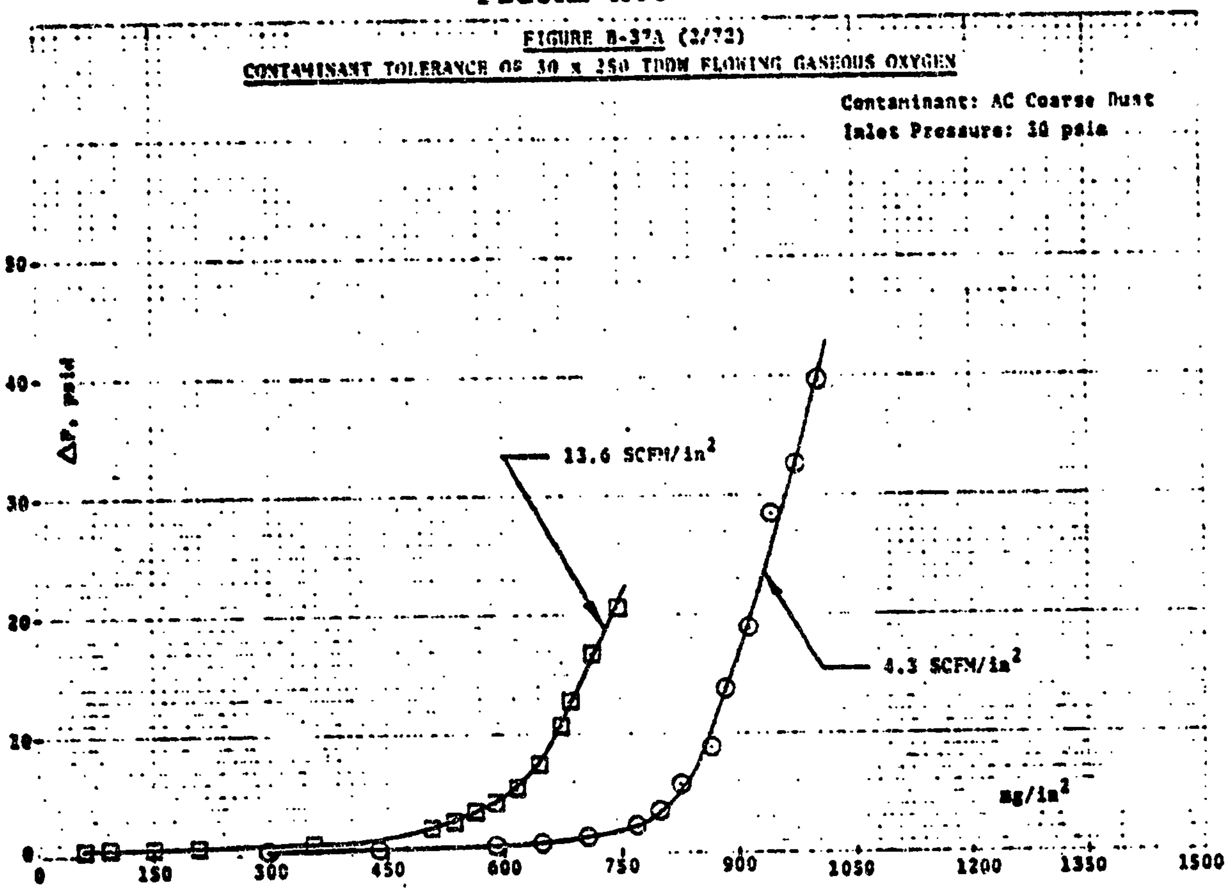

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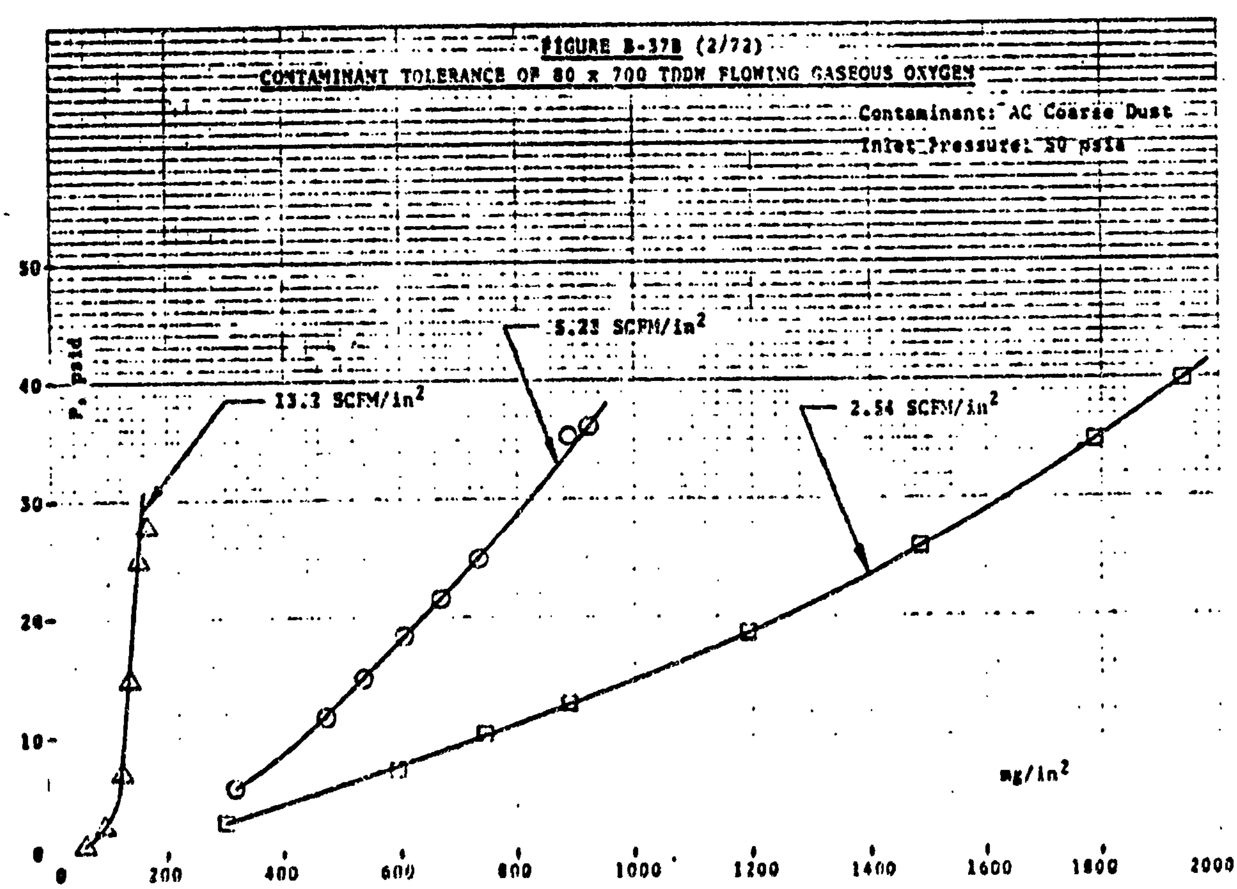

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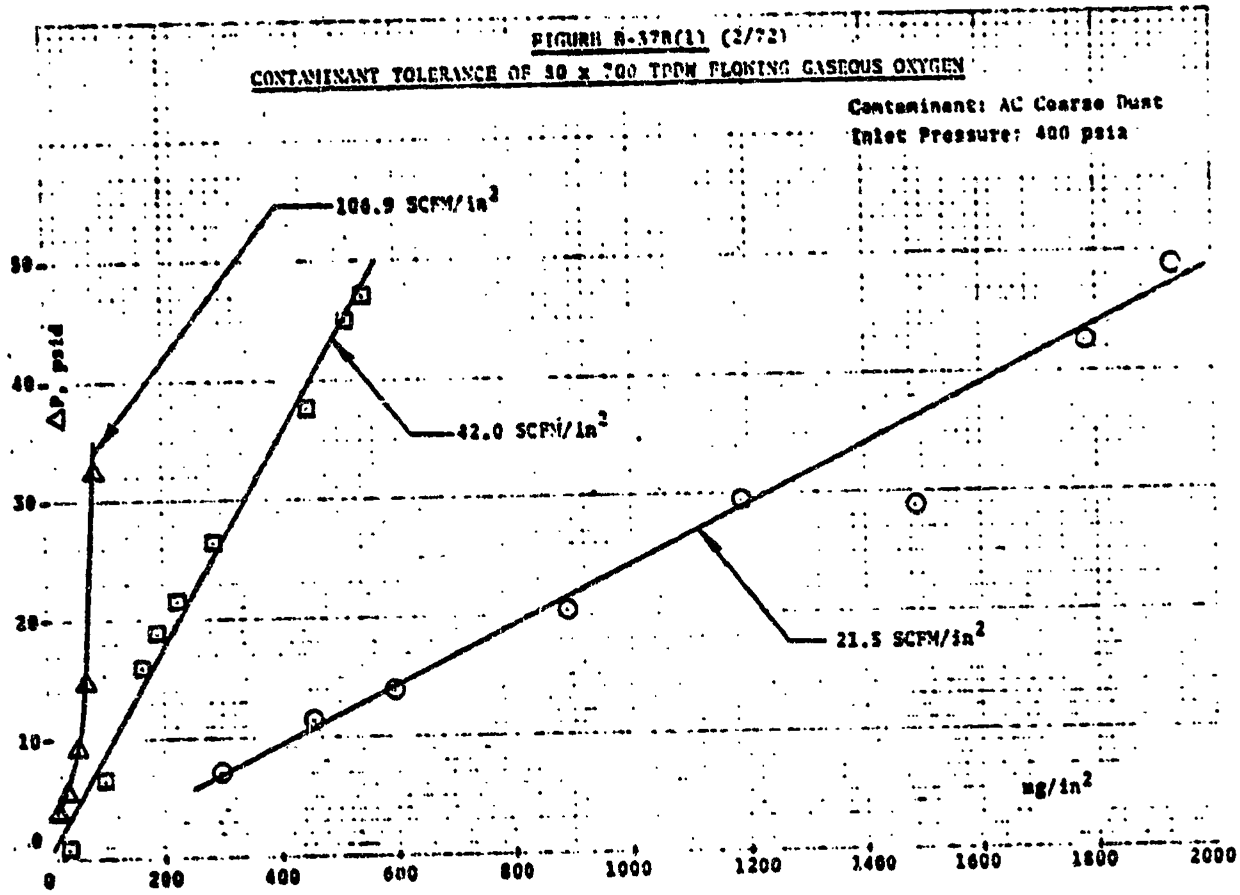

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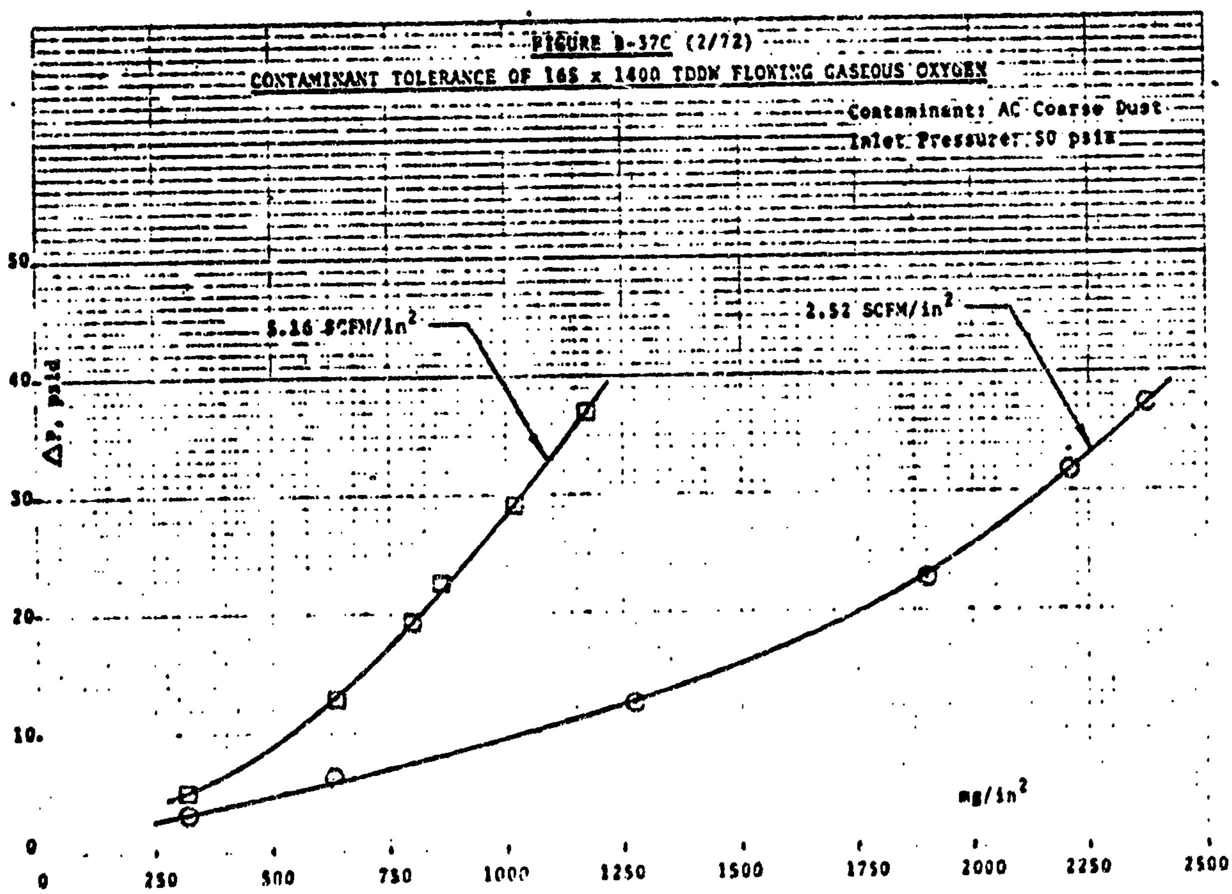

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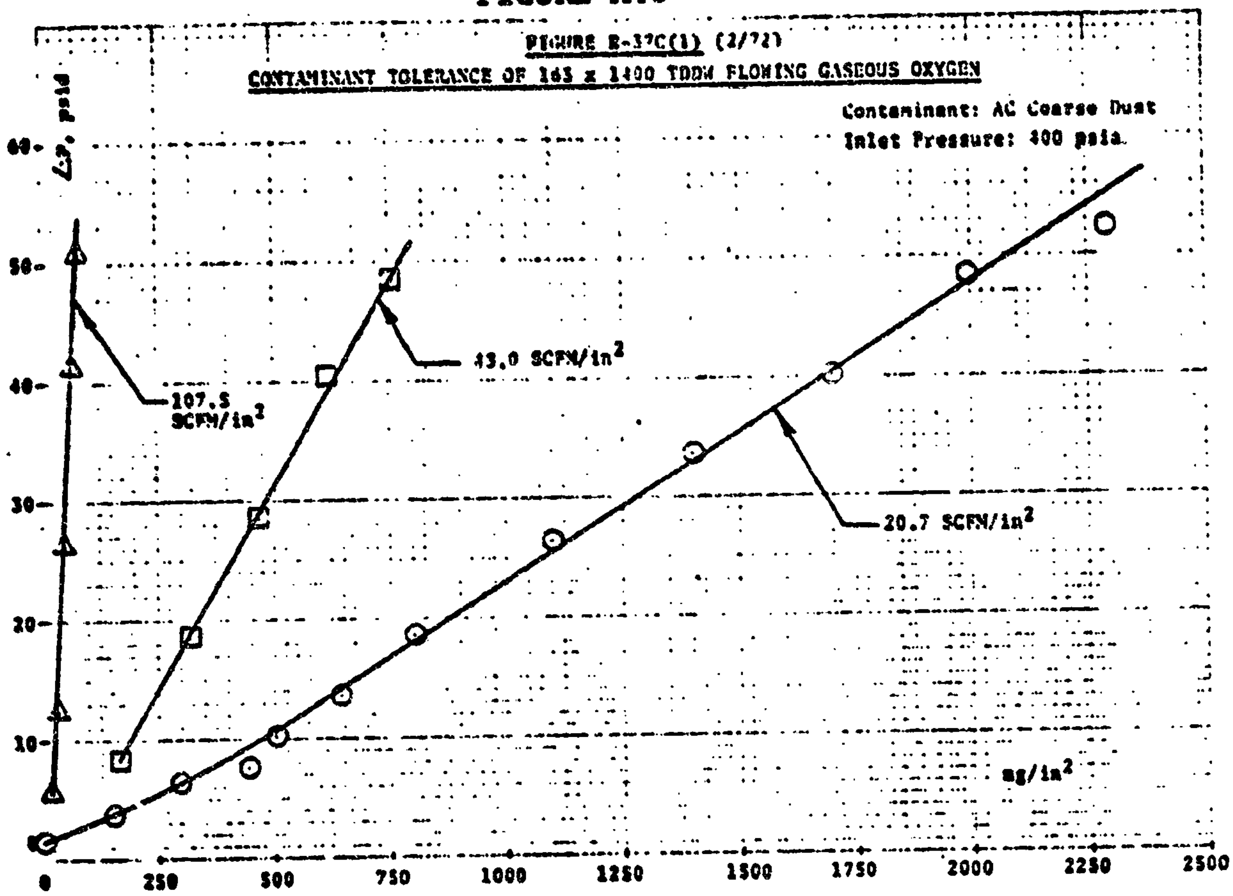
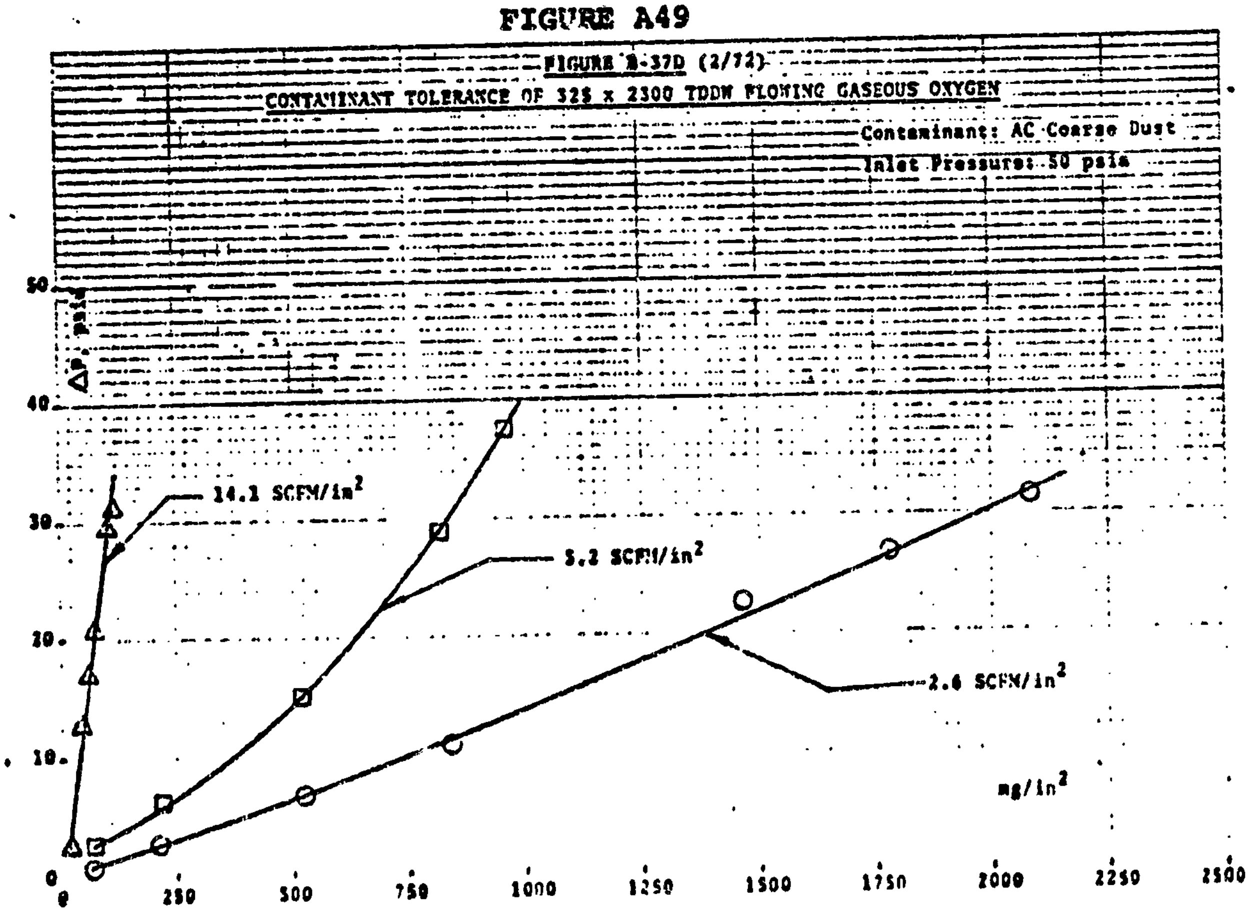


FIGURE A49



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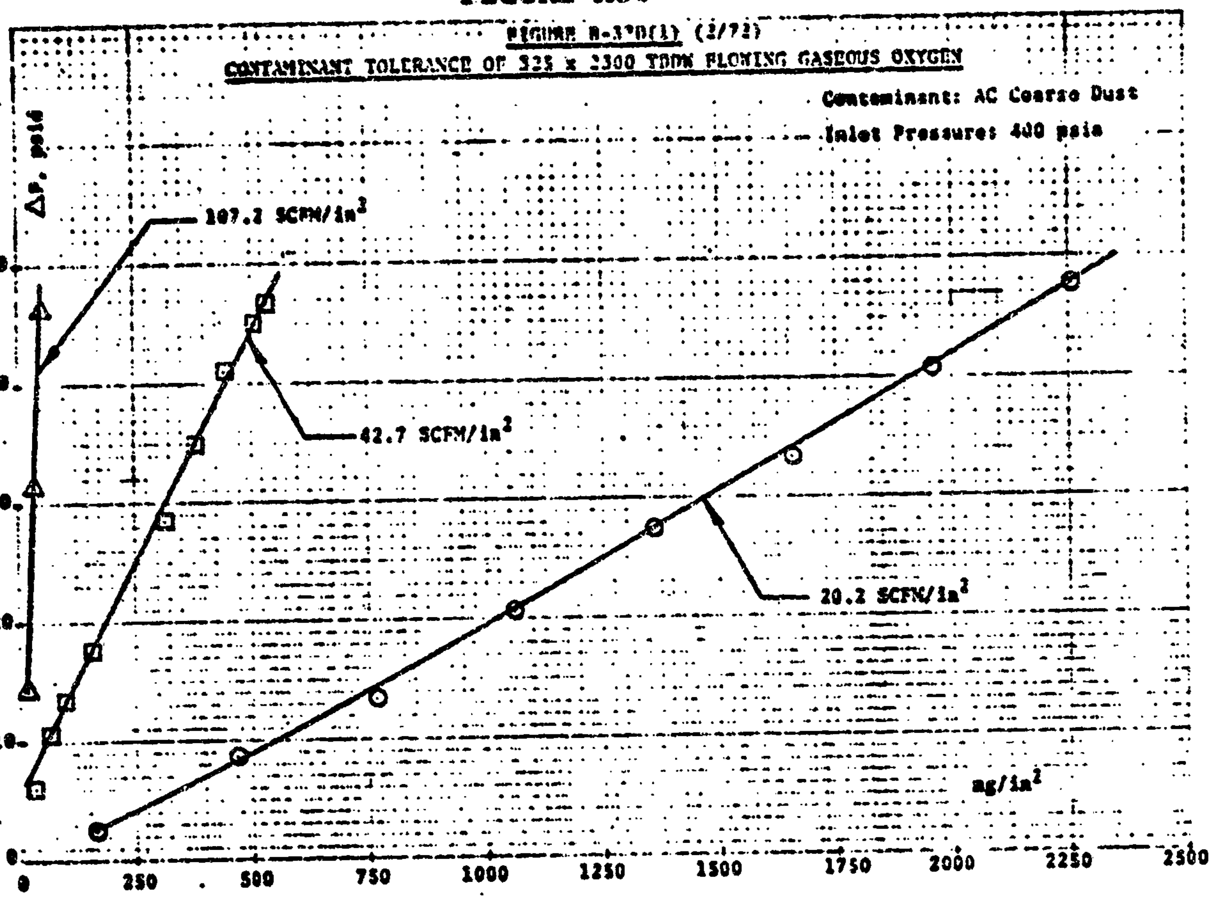

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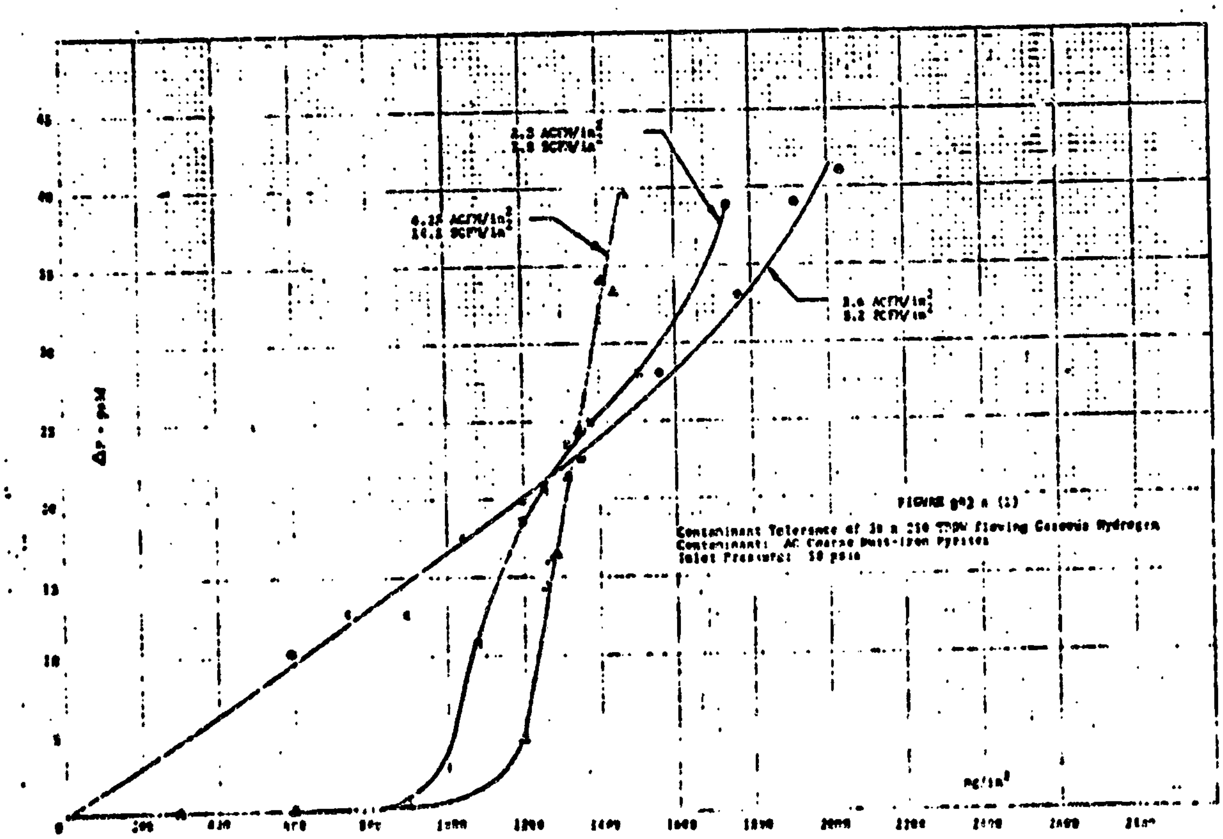


FIGURE A52

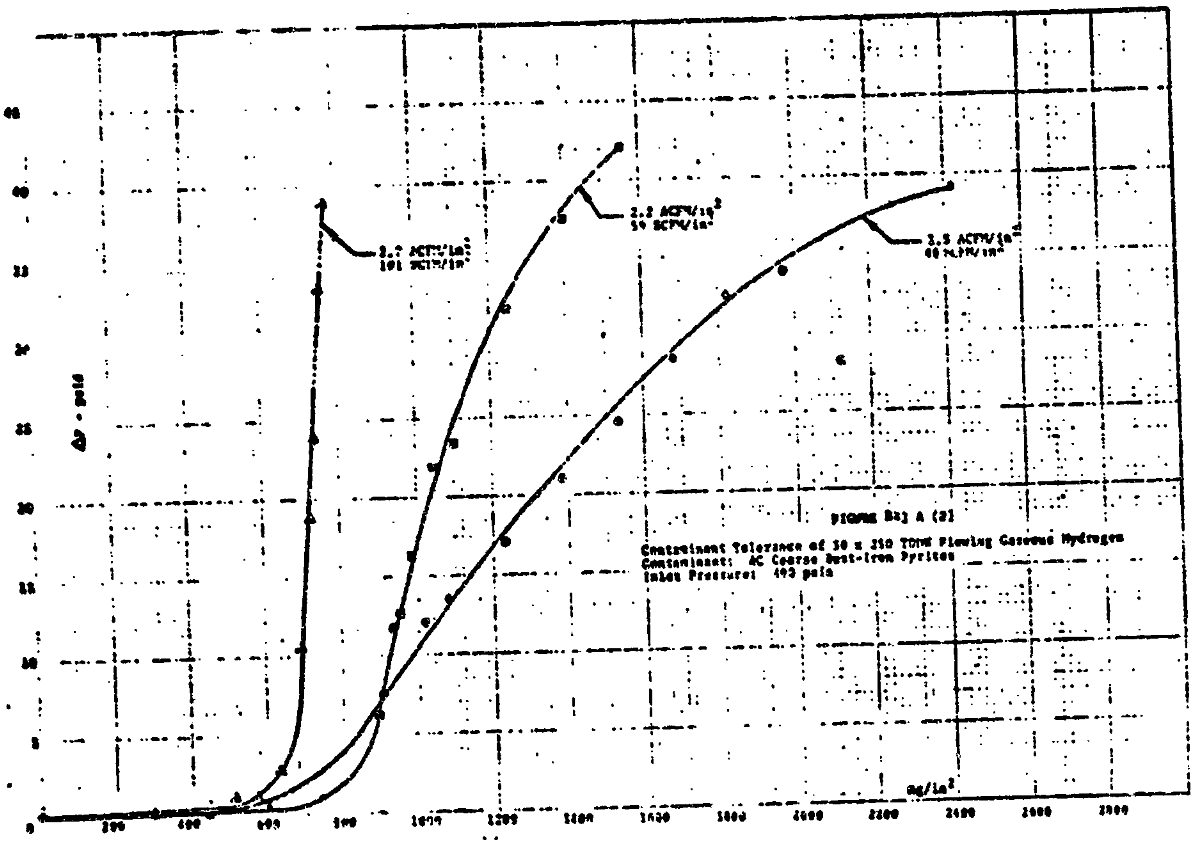
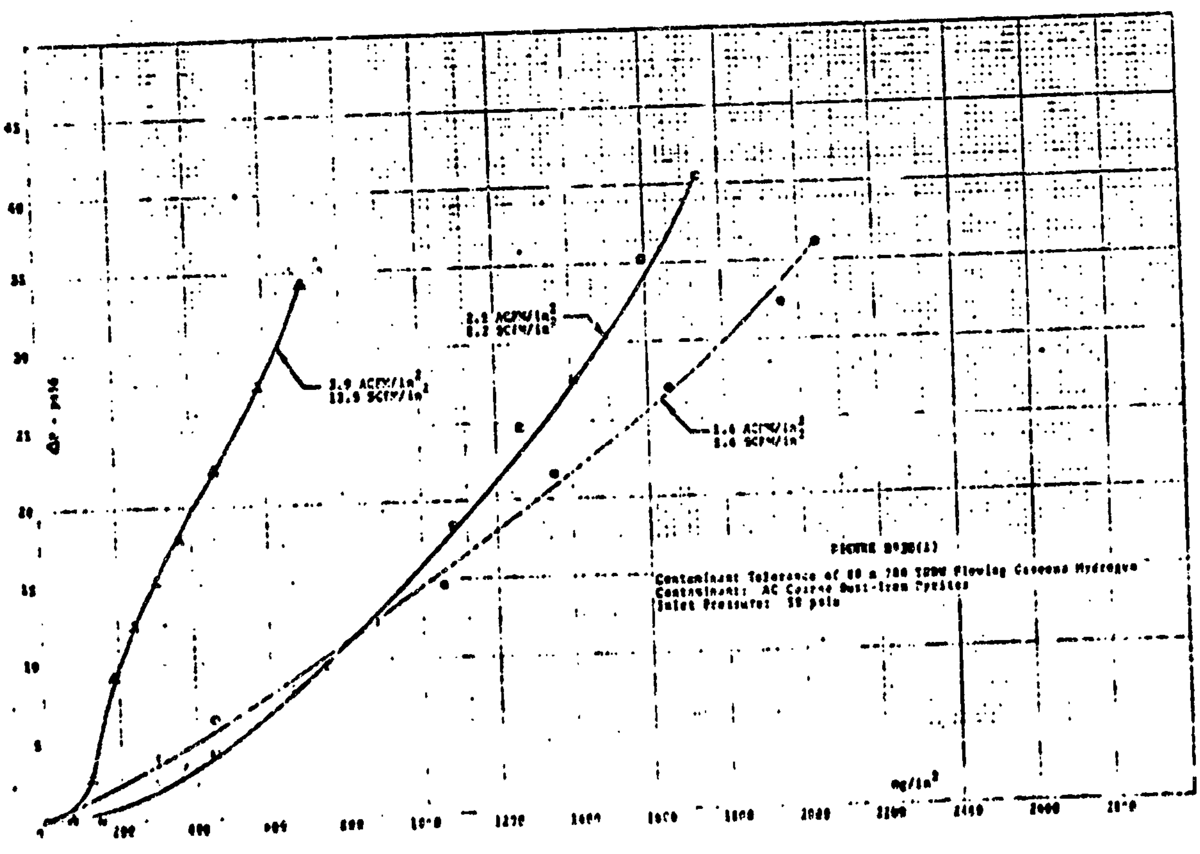


FIGURE A53



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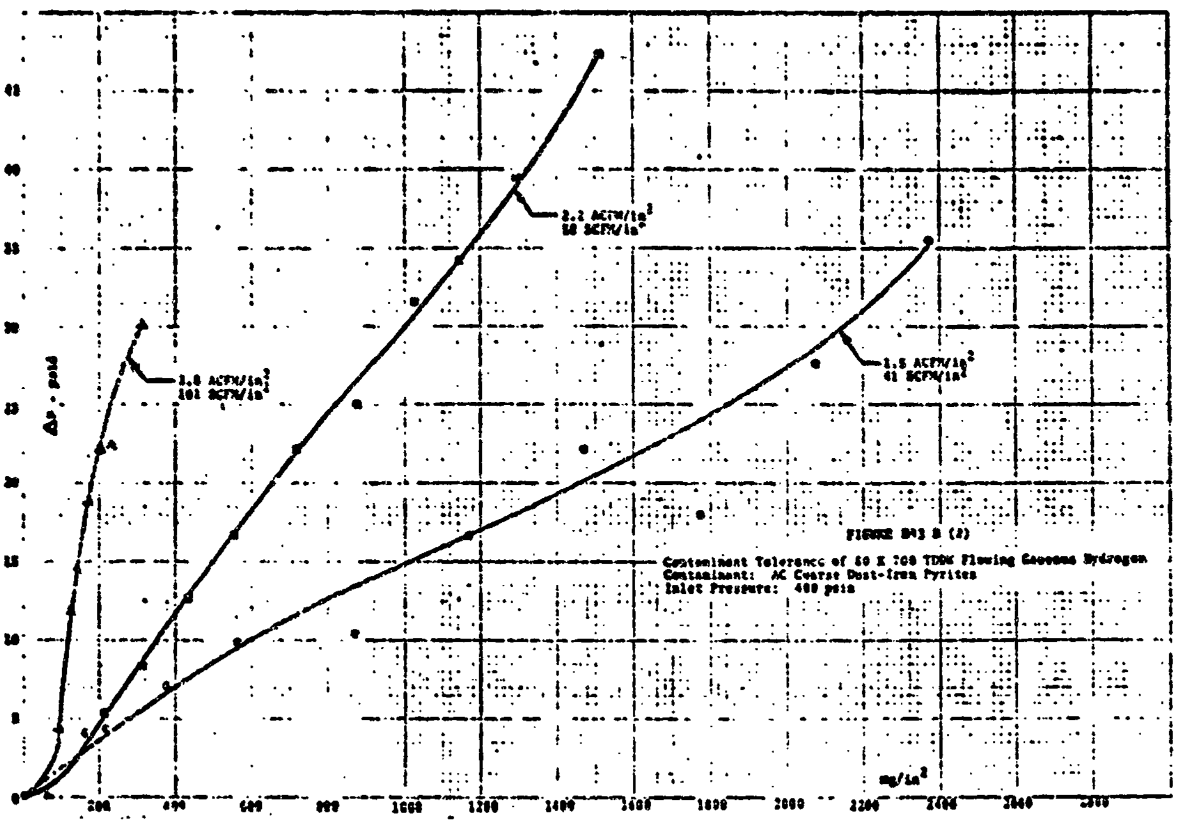

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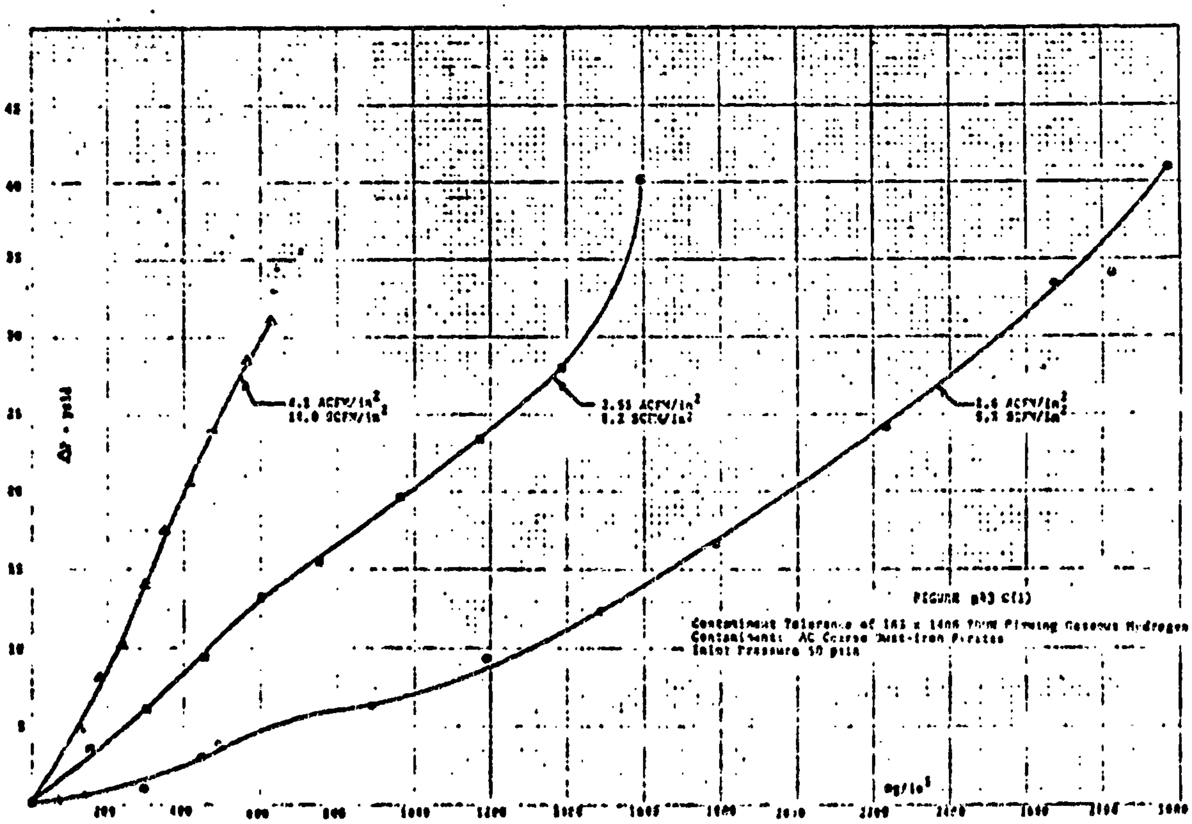
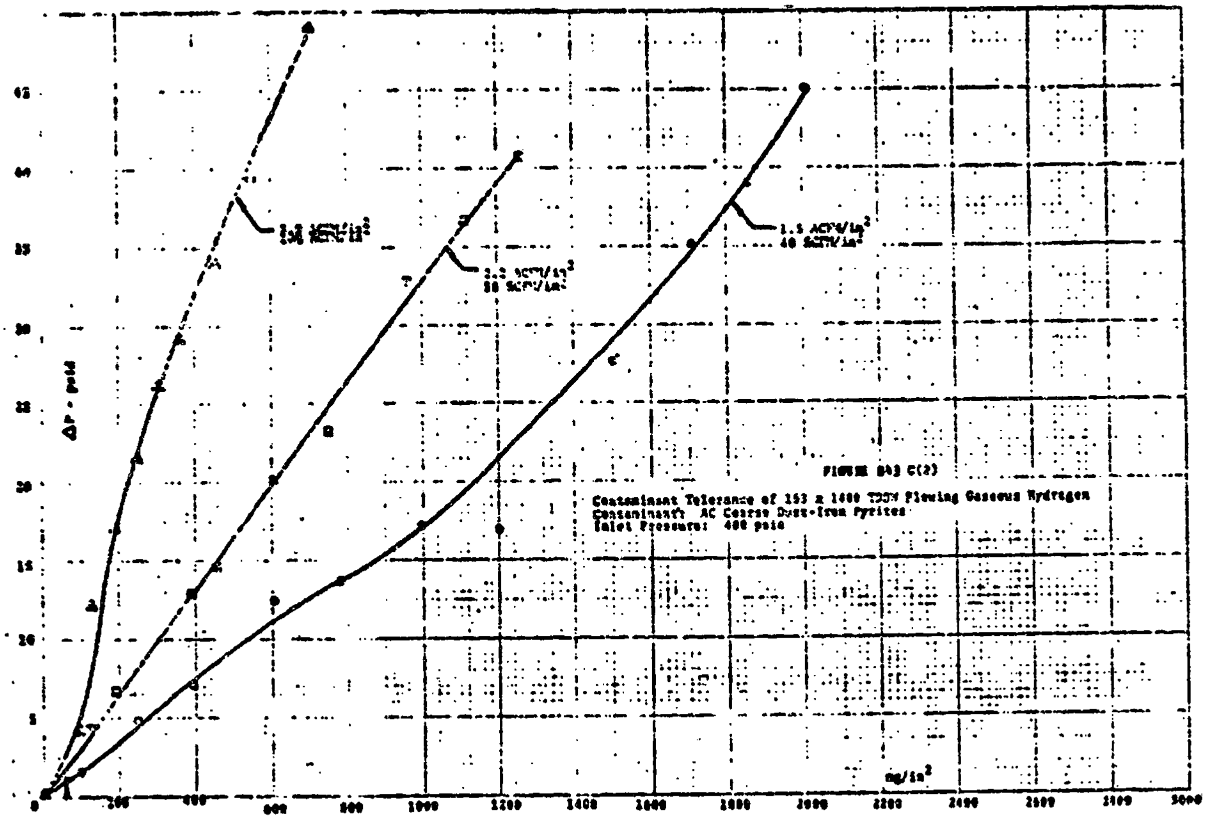


FIGURE A56



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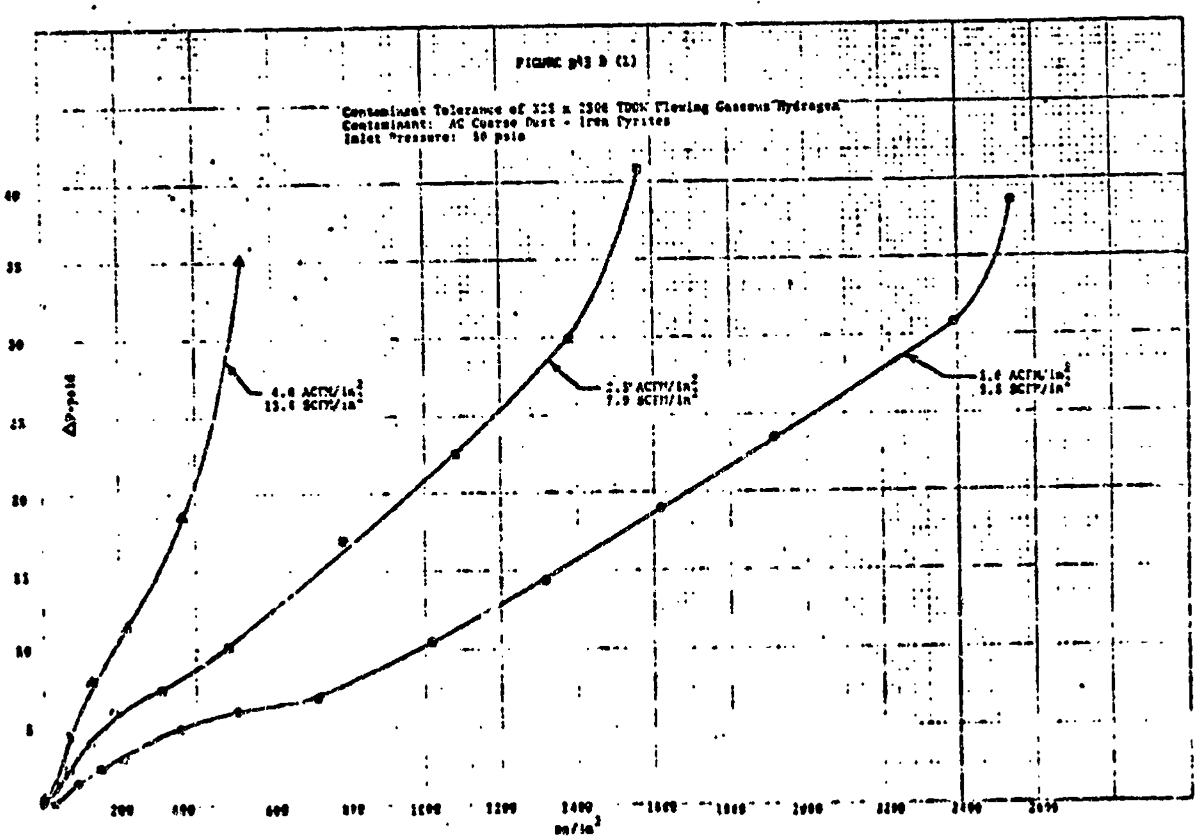


FIGURE A58

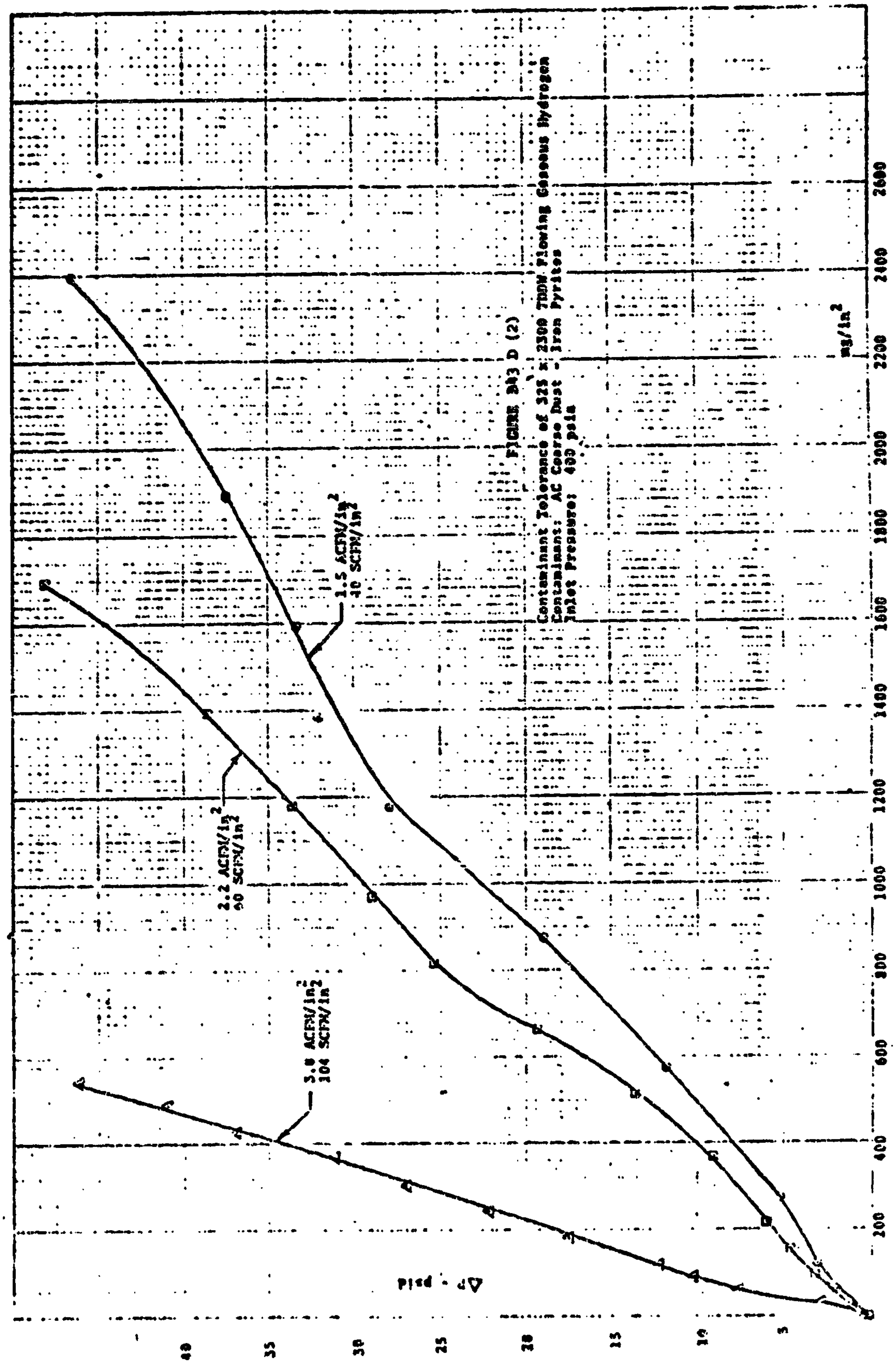

Contaminant Tolerance of 325 X 2300 TBDW Flowing Gaseous Hydrogen
Contaminant: AC Coarse Dust - Iron Pyrites
Inlet Pressure: 400 psia
1.5 ACFM/in²
40 SCFM/in²
2.2 ACFM/in²
90 SCFM/in²
ΔP - psid
mg/in²
5
10
15
20
25
30
35
40
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600

FIGURE A59

FIGURE B-11E (5/71)

CONTAMINANT TOLERANCE OF 325 x 2300 TDDW

Fluid: Deionized Water

Contaminant: PPO (Polyphenolene Oxide)

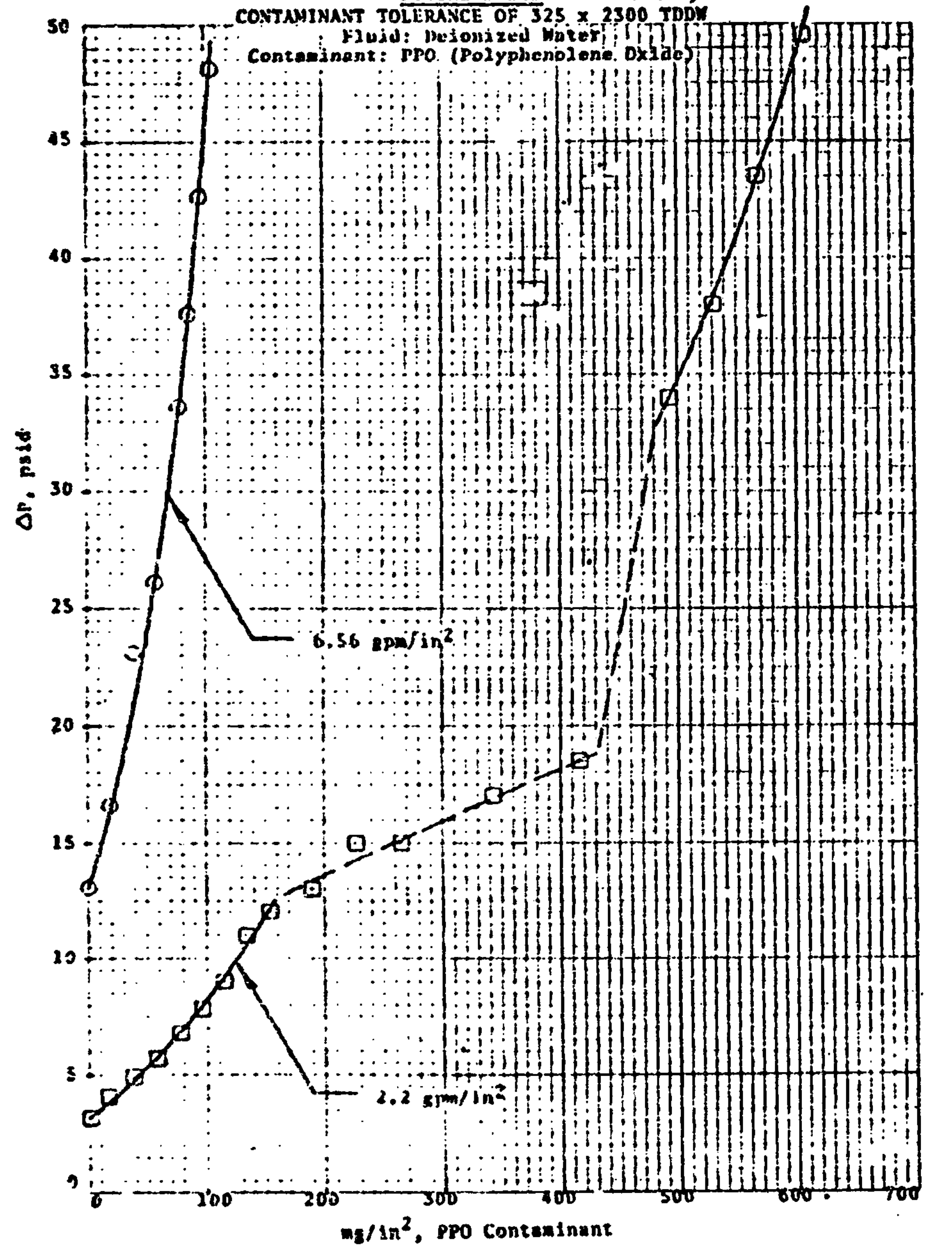


FIGURE A60

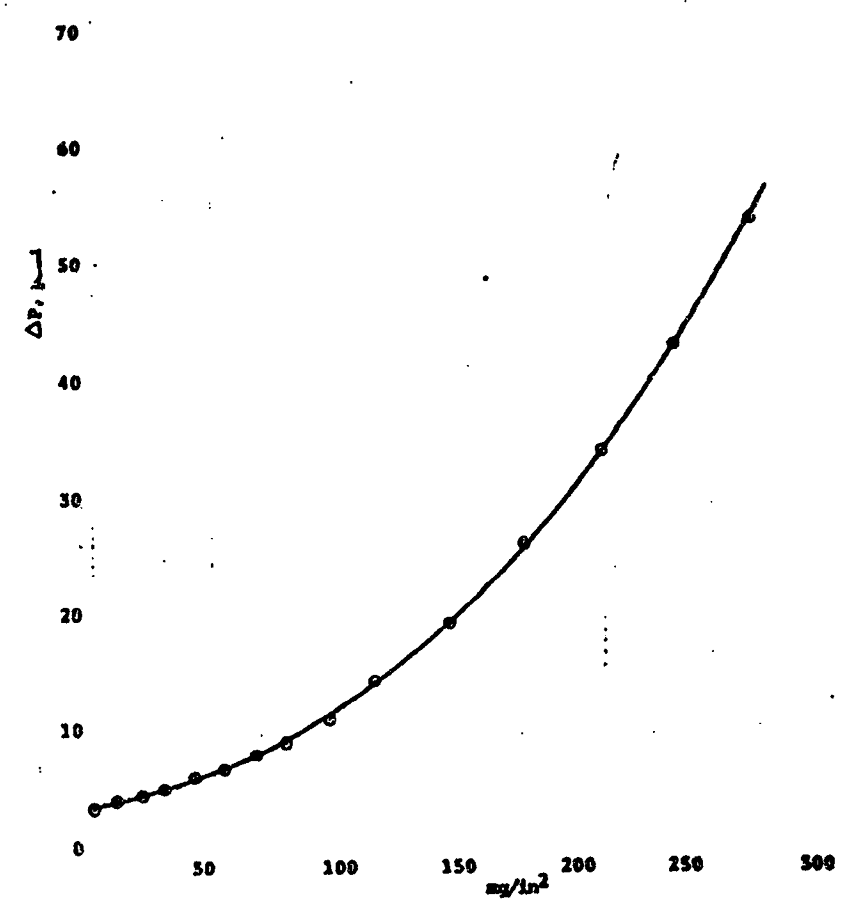
FIGURE B-19A

CONTAMINANT TOLERANCE OF 325 x 2300 TWILLED DUTCH DOUBLE WEAVE WIRE CLOTH

Fluid: Deionized Water @ 70°F

Contaminant: WSTF Dust (310-FTV)

Flow: 2.2 gpm/in²



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FILTER MEDIA CHARACTERIZATION

(SECTION B)

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TABLE B-1

CONTAMINANT TOLERANCE OF 80 x 700 TDDW

Deionzied Water @ 77 - 82°F, Contaminant: AC Fine Dust

Flow/Unit Area gpm/in²	Add Size, mg.	Accum. Add, mg.	Accum. Add, mg/in²	Net ΔP, psid Sample Number 1	Net ΔP, psid Sample Number 2
0.126	0	0	0	0.04	0.05
	30	30	18.9	0.06	0.04
	30	60	37.9	0.10	0.05
	30	90	56.8	0.27	0.26
	30	120	75.8	0.90	0.89
	30	150	94.7	2.6	2.32
	30	180	114	8.8	8.4
	30	210	133	42	44
	30	240	152	109	104
0.316	0	0	0	0.05	0.02
	30	30	18.9	0.09	0.09
	30	60	37.9	0.25	0.44
	30	90	56.8	1.5	5.33
	30	120	75.8	23	71
	30	150	94.7	125	
2.21	0	0	0	0.82	
	10	10	6.3	0.92	
	10	20	12.6	1.12	
	10	30	18.9	1.31	
	10	40	25.3	1.59	
	10	50	31.6	2.10	
	10	60	37.9	2.95	
	10	70	44.2	4.75	
	10	80	50.5	8.3	
	10	90	56.8	15.5	
	10	100	63.1	49	
	10	110	69.4	127	
	0	0	0	0.83	
	20	20	12.6	1.08	
	20	40	25.3	1.58	
	20	60	37.9	2.75	
	20	80	50.5	6.65	
	20	100	63.1	30	
6.57	0	0	0	5.0	5.0
	10	10	6.3	6.0	5.5
	10	20	12.6	6.5	6.5
	10	30	18.9	7.0	7.0
	10	40	25.3	8.0	8.5
	10	50	31.6	10.0	9.5
	10	60	37.9	11.5	12.0
	10	70	44.2	15.0	16.0
	10	80	50.5	22.5	21.5
	10	90	56.8	33.5	33.0
	10	100	63.1	63.0	

TABLE B-2

CONTAMINANT TOLERANCE OF 165 x 1400 TDDW

Deionized Water @ 78 - 88°F, Contaminant: AC Fine Dust

Flow/Unit Area gpm/in²	Add Size, mg.	Accum. Add, mg.	Accum. Add, mg/in²	Net ΔP, psid Sample Number 1	Net ΔP, psid Sample Number 2
0.126	0	0	0	0.07	
	20	20	12.6	0.19	
	20	40	25.3	2.92	
	20	60	37.9	35	
	20	80	50.5	73	
	0	0	0	0.07	
	30	30	18.9	0.29	
	30	60	37.9	8.2	
	30	90	56.8	72	
	30	120	75.8	122	
0.316	0	0	0	0.08	0.11
	[illegible]	10	6.3	0.15	0.19
	10	20	12.6	0.32	0.35
	10	30	18.9	0.94	1.11
	10	40	25.3	5.2	5.5
	10	50	31.6	23	33
	10	60	37.9	98	98
2.21	0	0	0	1.07	
	5	5	3.2	1.38	
	5	10	6.3	1.97	
	5	15	9.5	2.5	
	5	20	12.6	3.9	
	5	25	15.8	6.3	
	5	30	18.9	10.5	
	5	35	22.1	21.5	
	5	40	25.3	48.5	
	5	45	28.4	116.5	
	0	0	0	1.30	
	10	10	6.3	2.05	
	10	20	12.6	3.80	
	10	30	18.9	9.60	
	10	40	25.3	46	
6.57	0	0	0	6.5	7.0
	5	5	3.2	8.5	8.5
	5	10	6.3	10.0	10.5
	5	15	9.5	12.5	13.5
	5	20	12.6	15.5	19.0
	5	25	15.8	24.5	28.5
	5	30	18.9	41.0	51.5

TABLE B-3

CONTAMINANT TOLERANCE OF 325 x 2300 TDDW
Deionized Water @ 78 - 86°F, Contaminant: AC Fine Dust

Flow/Unit Area gpm/in^2	Add Size, mg.	Accum. Add, mg.	Accum. Add, mg/in^2	Net ΔP, psid Sample Number 1	Net ΔP, psid Sample Number 2
0.126	0	0	0	0.20	0.20
	10	10	6.3	0.50	0.36
	10	20	12.6	0.84	1.77
	10	30	18.9	8.62	3.92
	10	40	25.3	27	12
	10	50	31.6	45	36
	10	60	37.9	73	70
	10	70	44.2	--	92
0.316	0	0	0	0.37	0.36
	5	5	3.16	0.69	0.64
	5	10	6.31	1.14	1.15
	5	15	9.47	2.84	3.0
	5	20	12.63	12	14
	5	25	15.78	46	50
	5	30	18.94	102	129
2.21	0	0	0	2.95	
	4	4	2.5	3.95	
	4	8	5.1	5.95	
	3	11	6.9	8.75	
	3	14	8.8	14.5	
	3	17	10.7	24.0	
	4	21	13.3	49.5	
	0	0	0	3.15	
	4	4	2.5	4.60	
	4	8	5.1	6.85	
	4	12	7.6	12	
	4	16	10.1	22	
	4	20	12.6	47	
	4	24	15.2	97	
6.57	0	0	0	14.5	13.0
	3	3	1.89	19.0	17.5
	3	6	3.79	25.0	25.0
	3	9	5.68	40.5	37.0
	3	12	7.58	63.5	63.0

TABLE B-4

CONTAMINANT CAPACITY OF 30 x 250 TWILLED DUTCH DOUBLE WEAVE WIRE CLOTH

Fluid: Deionized Water; Type Contaminant: AC Coarse Dust

Contaminant			Time Int. Min.	Flow Rate		Sample Number								Avg. Net ΔP Psid	Avg. Temp °F
						1		2		3		4			
Add Size mg.	Accum. Adds mg.	Accum. Adds mg/in²		gpm	gpm/in²	Net ΔP Psid	Temp. °F	Net ΔP Psid	Temp. °F						
	0	0	2	10.5	6.63	5.40	72	5.66	77					5.53	74.5
	31.7	20				5.95		6.00						5.99	
31.7	63.4	40				6.70		6.80						6.75	
	95.1	60				7.82	75	7.94	80					7.88	77.5
	126.8	80				9.55		9.75						9.65	
	158.5	100				12.25	76	12.87	82.5					12.56	79.2
	174.3	110				14.52		15.27						14.9	
	190.1	120				17.62		19.00						18.3	
15.8	205.9	130				22.30	77	24.82	85					23.6	81.0
	221.7	140				29.40		34.42						31.9	
	237.5	150				42.50	78	50.28						46.4	
	0	0	2	3.5	2.21	0.71	75	0.81	75					0.76	75
	31.7	20				0.83		0.85						0.84	
	63.4	40				0.99		0.99						0.99	
31.7	95.1	60				1.15		1.19						1.17	
	126.8	80				1.44	75	1.53	75					1.49	75
	158.5	100				2.03		2.05						2.04	
	190.2	120				3.52		3.28						3.40	
	221.9	140				8.85		7.05						7.95	
	237.7	150						12.30						12.3	
15.8	253.5	160				32.07		26.32						29.2	
	269.4	170				87.30	75	60.60	75					74.0	75
63.4	0	0	2	0.22	0.136	0.01	79	0.01	78.5					0.01	78.8
	63.4	40				0.01		0.01						0.01	
	126.8	80				0.02		0.02						0.02	
	190.2	120				0.27		0.11						0.19	
31.7	221.9	140				1.90		0.72						1.31	
15.8	237.7	150				1.95		2.70						2.33	
	253.5	160				6.93		8.85						7.89	
	269.3	170				14.23		19.37						16.80	
	285.1	180				22.66		35.34						29.00	
	300.9	190				31.90	79	48.48	78.5					40.19	78.8
63.4	0	0	2	0.46	0.289	0.12	73.5	0.11	75					0.12	74.3
	63.4	40				0.14		0.14						0.14	
	126.8	80				0.17		0.17						0.17	
	190.2	120				0.32		0.36						0.34	
31.7	221.9	140				1.05		1.40						1.23	
15.8	237.7	150				2.84		4.82						3.83	
	253.5	160				17.34		15.57						16.46	
	269.3	170				33.73		36.43						35.08	
7.9	277.2	175				41.73		48.05						44.89	
	285.1	180				50.35	74	57.60	75.5					53.96	74.8

TABLE B-5

CONTAMINANT TOLERANCE OF 30 x 370 & 40 x 550 TDDW

Fluid: Deionized Water @ 78 - 87°F
Contaminant: AC Coarse Dust
Flow Rate Per Unit: 2.21 gpm/in^2

Type of Screen	Add Size, mg.	Accum Add, mg.	Accum Add, mg/in^2	Net ΔP, psid Sample Number 1	Net ΔP, psid Sample Number 2
30 x 370 TDDW	0	0	0	0.46	0.48
	60	60	37.9	0.59	0.64
	60	120	75.8	0.79	0.89
	60	180	113.6	1.28	1.55
	60	240	151.5	2.91	3.76
	60	300	189.9	10.5	12.5
	60	360	227.3	177	80.5
40 x 550 TDDW	0	0	0	0.36	0.46
	23.8	23.8	15	0.51	0.54
	23.8	47.6	30	0.62	0.64
	23.8	71.4	45	0.86	0.79
	23.8	95.2	60	-	1.06
	23.8	119.0	75	1.54	1.56
	23.8	142.8	90	3.66	2.76
	23.8	166.6	105	12	7.4
	23.8	190.4	120	71	31.5
	15.8	206.2	130	-	97

TABLE B-6

CONTAMINANT CAPACITY OF 80 x 700 TWILLED DUTCH DOUBLE WEAVE WIRE CLOTH

Fluid: Deionized Water; Type Contaminant: AC Coarse Dust

Contaminant				Flow Rate		Sample Number									
						1		2		3		4			
Add Size mg.	Accum. Adds mg.	Accum. Adds mg/in^2	Time Int. Min.	gpm	gpm/in^2	Net ΔP Psid	Temp. °F	Net ΔP Psid	Temp. °F	Net ΔP Psid	Temp. °F			Avg. Net ΔP Psid	Avg. Temp °F
31.7	0	0	2	0.46	0.289	0.13	74	0.16	72					0.15	73
	31.7	20				.205		0.241						0.22	
	63.4	40				1.044		1.310						1.18	
15.8	79.2	50				4.203								4.20	
	95.0	60				12.18		16.13						14.16	
	110.8	70				25.94		34.76						30.35	
	126.6	80				44.86	75	55.76	73					50.31	74
47.5	0	0	2	0.22	0.136	0.015	73.5	0.013	74	0.01	75			0.013	74.2
	47.5	30				0.168		0.16		0.11				0.146	
	71.3	45				1.814				1.07				1.44	
	95.1	60				9.08		6.13		5.68				6.96	
23.8	118.9	75				21.94		17.4		14.63				17.99	
	142.7	90				37.30		30.62		24.21				30.71	
	166.5	105				52.30	73.5	44.04	74	36.28	75			44.21	74.2
11.1	0	0	2	10.5	6.63	6.72	77	6.90	78.5					6.81	77.8
	11.1	7				8.18		8.35						8.27	
	22.2	14				10.33		10.77						10.5	
	33.3	21				14.50	77	15.05	80					14.8	78.5
	44.4	28				22.50		24.22						23.4	
4.8	49.2	31				30.04		32.12						31.1	
	54.0	34				42.28	77	45.0	80.5					43.6	78.8
16	0	0	2	3.5	2.21	1.25	78.5	0.92	77					1.09	77.8
	16	10				1.59		1.27						1.43	
	32	20				2.32		1.92						2.12	
	48	30				4.77		3.90						4.34	
	64	40				13.60	77.5	11.88	77					12.7	77.3
	68	43						17.69						17.7	
	73	46						[illegible]5.66						25.7	
	78	49						39.14						39.1	
	79	50				43.90								43.9	
	82	52						59.54						59.5	
	84	53				64.28	77.5		77.5					64.3	77.5

TABLE B-7

CONTAMINANT CAPACITY OF 165 x 1400 TWILLED DUTCH DOUBLE WEAVE WIRE CLOTH

FLUID: Water At 65 - 80 F

GRADE OF WIRE CLOTH	CONTAMINANT				Time Interval Min.	FLOW RATE		NET DIFFERENTIAL PRESSURE psid				Avg. Net Diff. Press., psid.
	Type	Add Size, mg.	Accum. Adds, mg.	Accum. Adds mg/in^2		gpm	gpm/in^2	Sample Number 1	2	3	4	
165 x 1400	AC Coarse	30	0	0	2	0.22	0.136	.065				.065
			30	18.9				.18				.18
			60	37.9				1.12				1.12
			90	56.8				6.12				6.12
			120	75.8				11.72				11.72
			150	94.7				16.32				16.32
			180	113.6				21.52				21.52
			210	132.6				27.22				27.22
			240	151.5				30.92				30.92
			270	170.5				35.92				35.92
			300	189.4				40.92				40.92
			330	208.3				45.92				45.92
165 x 1400	AC Coarse	30	0	0	2	0.46	0.289	0.22	0.2	0.22		0.21
			30	18.9				0.57	0.6	0.6		0.59
			60	37.9				5.4	5.8	5.1		5.43
			90	56.8				26.1	20.6	22.8		23.17
			120	75.8				53.1	43.6	45.1		47.27
165 x 1400	AC Coarse	10	0	0	2	3.5	2.21	1.29	1.22			1.26
			10	6.31				1.89	1.82			1.86
			20	12.6				3.09	2.58			2.84
			30	18.9				5.59	5.02			5.31
			40	25.3				10.39	10.22			10.3
			50	31.6				23.89	20.92			22.4
			60	37.9				51.89	43.22			47.6
165 x 1400	AC Coarse	5/10	0	0	2	10.5	6.63	8.1	8.62			8.36
			5	3.16				9.6				9.60
			10	6.31				11.6	11.1			11.35
			15	9.47				14.8				14.8
			20	12.6				19.1	19.1			19.1
			25	15.8				27.2				27.2
			30	18.9				45.1	41.1			43.1

TABLE B-8

CONTAMINANT TOLERANCE OF 200 X 1400 TDDW WIRE CLOTH

Fluid: Deionized Water
Contaminant: AC Coarse Dust

Grade of Screen	Temp. °F	Contaminant Accum Adds mg.	Contaminant Accum Adds mg/in²	Flow Rate gpm	Flow Rate gpm/in²	Net ΔP psid
200 x 1400	71	0	0	0.2	0.126	0.125
		50	31.57			4.1
		65	41.04			9.5
		80	50.51			16.8
		95	59.97			25.4
		110	69.44			31.0
		125	78.91			37.5
		140	88.38			44.2
	71	0	0.00	0.458	0.289	0.29
		20	12.63			0.64
		40	25.25			3.7
		60	37.88			13.7
		70	44.19			24.9
		80	50.51			41.9
	72	0	0.00	3.5	2.21	2.14
		10	6.31			3.56
		20	12.63			6.76
		30	18.94			13.6
		40	25.25			30.8
		45	28.41			44.3
		50	31.57			63.3
	73	0	0.00	10.4	6.57	10.0
		5	3.16			13.0
		10	6.31			16.8
		15	9.47			22.5
		20	12.63			31.3
		23	14.52			39.8
		26	16.41			49.3

TABLE B-9

CONTAMINANT CAPACITY OF 325 x 2300 TWILLED DUTCH DOUBLE WEAVE WIRE CLOTH

FLUID: Deionized Water At 65 - 80 F

GRADE OF WIRE CLOTH	CONTAMINANT				Time Interval Min.	FLOW RATE		NET DIFFERENTIAL PRESSURE psid Sample Number				Avg. Net Diff. Press., psid.
	Type	Add Size, mg.	Accum. Adds, mg.	Accum. Adds mg/in^2		gpm	gpm/in^2	1	2	3	4	
325 x 2300	AC Coarse	30	0	0	2	0.22	0.136	0.2	0.2	0.2	0.2	0.2
			30	18.9				1.8	1.1	1.3	1.99	1.55
			60	37.9				11.5	8.9	9.8	15.12	11.3
			90	56.8				30.0	24.5	26.0	29.72	27.6
			120	75.8				52.0	44.0	44.0	46.42	46.5
325 x 2300	AC Coarse	30	0	0	2	0.46	0.289	0.43	0.48	0.47		0.46
			30	18.9				3.4	2.6	4.2		3.4
			60	37.9				26.4	23.5	29.1		26.3
			90	56.8				68.6	64.6	73.1		68.8
325 x 2300	AC Coarse	4	0	0	2	3.5	2.21	4.05	3.72			3.89
			4	2.53				5.65	4.82			5.24
			8	5.05				7.97	6.42			7.20
			12	7.58				12.12	8.80			10.5
			16	10.10				16.92	11.82			14.4
			20	12.63				24.02	18.42			21.2
			24	15.15				35.22	26.72			31.0
			28	17.68				49.22	39.22			45.2
325 x 2300	AC Coarse	.35	0	0	2	10.5	6.63	16.8	15.1	15.1		15.67
			3.5	2.21				21.6	19.6	21.6		20.93
			7.0	4.42				26.6	26.1	27.6		26.77
			10.5	6.63				32.6	35.3	37.6		35.17
			14.0	8.84				44.1	47.6	56.1		49.27

TABLE B-10

CONTAMINANT CAPACITY OF 450 x 2750 TDDW WIRE CLOTH

Fluid: Deionized Water
Contaminant: AC Coarse Dust

Flow Rate, gpm	Temp °F	gpm/in²	Accum. Adds mg	Accum. Adds, mg/in²	Net ΔP, psid
10.5	78	6.63	0	0	21.5
	78		3	1.89	27.5
	78		6	3.79	35
	79		9	5.68	47
	80		12	7.58	65
7.0	80	4.42	0	0	10
	79		3	1.89	13
	79		6	3.79	17
	79		9	5.68	22
	80		12	7.58	30
	80		15	9.47	40
	80		18	11.4	55
3.5	82	2.21	0	0	4.2
	81		3	1.89	5.0
	81		6	3.79	6.5
	81		9	5.68	8.3
	81		12	7.58	10.6
	81		15	9.47	14
	81		18	11.4	19
	80		21	13.3	26
	80		24	15.2	36
	80		27	17.0	49
	80		30	18.9	65
0.458	69	0.289	0	0	0.81
	69		8	5.1	1.95
	69		16	10.1	5.01
	69		24	15.2	11.9
	69		32	20.2	27.8
	69		40	25.3	58.8
0.215	68	0.136	0	0	0.27
	68		8	5.1	0.54
	68		16	10.1	0.95
	68		24	15.2	1.65
	68		32	20.2	3.18
	68		40	25.3	6.65
	68		48	30.3	12.9
	68		56	35.4	26.0
	68		64	40.4	45.0

TABLE B-11

CONTAMINANT TOLERANCE OF PLAIN DUTCH SINGLE WEAVE WIRE CLOTH

Fluid: Deionized Water

Contaminant: AC Coarse Dust

Grade of Screen	Temp °F	Contaminant Accum. Add mg.	Contaminant Accum. Add mg/in²	Flow Rate gpm	Flow Rate gpm/in²	Net ΔP psid
30 x 250	70	0	0	0.2	0.126	0.015
		65	41.04			0.015
		130	82.08			0.015
		195	123.12			0.015
		260	164.16			0.015
		325	205.20			0.025
		390	246.24			0.035
		455	287.28			0.065
		520	328.32			0.115
		585	369.36			0.175
		650	410.40			0.275
		715	441.44			2.675
		730	452.48			14.275
		795	491.95			19.775
		810	501.42			23.975
		825	510.89			30.475
		840	520.35			36.475
		855	529.83			41.475
		870	539.30			48.375
	71	0	0	0.458	0.289	0.09
		65	41.04			0.09
		130	82.08			0.09
		195	123.12			0.10
		260	164.16			0.10
		325	205.20			0.17
		390	246.24			0.53
		455	287.28			9.69
		470	296.75			17.89
		485	306.22			30.89
		500	315.69			4[illegible].89
	72	0	0	3.5	2.21	0.16
		50	31.57			0.19
		100	63.13			0.21
		150	94.70			0.26
		200	126.26			0.36
		250	157.83			0.52
		300	189.40			0.86
		350	220.97			2.[illegible]
		400	252.50			13.46
		415	261.99			30.26
		420	265.15			51.76
		425	268.31			57.76
	72	0	0	10.4	6.57	0.8
		50	31.57			0.94
		100	63.13			1.15
		150	94.70			1.45
		200	126.26			1.93
		250	157.83			2.75
		300	189.40			4.40
		350	220.97			8.50
		365	230.44			11.30
		380	239.91			15.80
		405	[illegible].38			23.30
		420	[illegible].85			3[illegible].60
		425	[illegible].02			[illegible].50
30 x 160	70	0	0	0.2	0.126	0.020
		65	41.04			0.020
		130	82.07			0.020
		195	123.11			0.030
		260	164.14			0.020
		325	205.18			0.025
		390	246.21			0.105
		455	287.25			0.475
		520	328.28			5.280
		585	369.32			18.380
		650	410.35			42.980
	70	0	0	0.458	0.289	0.040
		65	41.04			0.060
		130	82.07			0.080
		195	123.11			0.103
		260	164.14			0.140
		325	205.18			0.203
		390	246.21			5.100
		455	287.25			39.400
	70	0	0	3.5	2.21	0.130
		50	31.57			0.160
		100	63.13			0.190
		150	94.70			0.260
		200	126.26			0.390
		250	157.83			0.740
		300	189.39			2.060
		350	220.96			8.560
		365	230.43			19.300
		380	237.90			39.500
	79	0	0	10.4	6.57	0.700
		50	31.57			0.800
		100	63.13			1.050
		150	94.70			1.400
		200	126.26			2.000
		250	157.83			3.800
		300	189.39			6.000
		350	220.96			19.600
		365	230.43			41.350
60 x 600	71	0	0	0.2	0.126	0.025
		50	31.57			0.075
		100	63.13			0.155
		150	94.70			0.575
		200	126.26			4.[illegible]75
		230	145.20			10.975
		260	164.14			17.975
		290	183.08			26.675
		320	202.02			36.475
		350	220.96			44.075
	70	0	0	0.458	0.289	0.07
		30	18.94			0.09
		60	37.88			0.19
		90	56.82			0.74
		120	75.76			3.74
		150	94.70			11.69
		165	104.17			20.19
		180	113.64			29.39
		195	123.12			39.5[illegible]
		210	132.58			49.89
	72	0	0	3.5	2.21	0.17
		20	12.63			0.21
		40	25.25			0.46
		60	37.88			0.8[illegible]
		80	50.51			1.96
		100	63.13			4.90
		120	75.76			15.54
		130	82.07			28.26
		140	88.38			48.76
	72	0	0	10.4	6.57	1.07
		15	9.47			1.48
		30	18.94			2.05
		45	28.41			3.15
		60	37.88			5.20
		75	47.35			9.70
		90	56.82			24.0
		95	59.97			32.8
		100	63.13			58.9
100 x 900	69	0	0	0.2	0.126	0.025
		30	18.94			0.075
		60	37.88			0.375
		90	56.82			1.375
		120	75.76			4.775
		150	94.70			10.275
		180	113.64			16.775
		210	132.58			23.775
		240	151.52			30.475
		270	170.46			37.075
		300	189.39			44.175
	69	0	0	0.458	0.289	0.05
		30	18.94			0.16
		60	37.88			0.79
		90	56.82			1.65
		120	75.76			5.94
		150	94.70			14.39
		180	113.64			25.19
		195	123.11			33.39
		210	132.58			40.39
	70	0	0	3.5	2.21	0.38
		15	9.47			0.71
		30	18.94			1.39
		45	28.41			2.79
		60	37.88			6.[illegible]
		75	47.35			16.76
		90	56.82			37.26
		105	66.29			74.26
	70	0	0	10.4	6.57	1.65
		10	6.31			2.65
		20	12.63			4.60
		30	18.94			6.70
		40	25.25			12.02
		50	31.57			23.08
		55	34.72			34.68
		60	37.88			53.50
165 x 800	71	0	0	0.2	0.126	0.05
		30	18.94			0.06
		60	37.88			0.14
		90	56.82			0.33
		120	75.76			0.46
		150	94.70			1.18
		180	113.64			1.81
		210	132.58			5.45
		240	151.52			13.69
		255	160.99			30.94
		270	176.45			33.49
		285	179.92			34.58
		300	189.39			39.55
		315	198.86			36.95
		330	208.33			38.79
		345	217.09			44.14
	70	0	0	0.458	0.289	0.09
		30	18.94			0.39
		60	37.88			0.09
		90	56.82			4.39
		120	75.76			13.69
		135	85.23			19.59
		150	94.70			28.67
		165	104.17			30.99
		180	113.64			43.37
	70	0	0	3.5	2.21	0.36
		15	9.47			0.71
		30	18.94			1.56
		45	28.41			3.06
		60	37.88			8.76
		75	47.35			20.76
		80	50.51			37.76
		85	53.66			39.76
		90	56.83			47.76
		0	0	10.4	6.57	1.85
		10	6.31			2.75
		20	12.63			4.50
		30	18.95			7.30
		40	25.25			15.3
		45	28.41			21.5
		50	31.57			32.0
		55	34.72			[illegible].3

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

TABLE B-12

CONTAMINANT TOLERANCE OF PLAIN DUTCH SINGLE WEAVE (DOUBLE WARP) WIRE CLOTH

Fluid: Deionized Water

Contaminant: AC Coarse Dust

Grade of Screen	Temp °F	Contaminant Accum. Adds mg.	Contaminant Accum. Adds mg/in²	Flow Rate gpm	Flow Rate gpm/in²	Net ΔP psid
2 x 150 x 800	70	0	0	0.2	0.126	0.025
		30	18.94			0.125
		60	37.88			0.93
		90	56.82			3.88
		120	75.76			8.58
		135	82.23			11.28
		150	94.70			14.28
		165	104.17			16.98
		180	113.64			20.38
		195	123.11			23.68
		210	132.58			26.78
		225	142.05			30.48
		240	151.52			34.48
		255	160.98			37.98
		270	170.46			41.48
	70	0	0	.45	0.289	0.12
		30	18.94			0.34
		60	37.88			1.94
		90	56.82			8.59
		105	66.29			14.39
		120	75.76			20.89
		135	85.23			27.90
		150	94.70			35.89
		165	104.17			44.39
	69	0	0	3.5	2.21	0.66
		15	9.47			1.38
		30	13.94			3.41
		45	28.41			9.06
		55	34.72			17.46
		65	41.04			33.26
		75	47.35			60.26
	71	0	0	10.4	6.5	2.93
		10	6.31			4.70
		20	12.63			8.10
		30	18.94			17.10
		35	22.10			24.90
		40	25.25			36.80
		45	28.41			55.80

Grade of Screen	Temp °F	Contaminant Accum. Adds mg.	Contaminant Accum. Adds mg/in²	Flow Rate gpm	Flow Rate gpm/in²	Net ΔP psid
2 x 120 x 650	69	0	0	0.2	0.126	0.05
		30	18.94			0.08
		60	37.88			0.23
		90	56.82			1.23
		120	75.76			5.08
		150	94.70			10.18
		180	113.64			16.98
		210	132.58			22.48
		240	151.52			30.48
		270	170.46			36.28
		300	189.39			42.98
		330	208.33			49.78
	70	0	0	0.46	0.289	0.09
		30	18.94			0.29
		60	37.8[illegible]			1.49
		90	56.82			7.19
		120	75.76			19.69
		135	85.23			28.59
		150	94.70			37.89
		165	104.17			48.89
	71	0	0	3.5	2.21	0.51
		15	9.47			0.96
		30	18.94			2.06
		45	28.41			[illegible].11
		60	37.88			12.96
		65	41.04			15.96
		70	44.19			22.46
		75	47.35			30.76
		80	50.51			41.76
	71	0	0	10.4	6.57	2.63
		10	6.31			4.12
		20	12.63			6.91
		30	18.94			12.6
		40	25.25			25.1
		45	28.41			37.8
		50	31.57			59.3

TABLE B-13

CONTAMINANT TOLERANCE OF TWILLED SQUARE WEAVE WIRE CLOTH

Fluid: Deionized Water

Contaminant: AC Coarse Dust

Grade of Screen	Temp °F	Contaminant Accum. Adds mg.	Contaminant Accum. Adds mg/in²	Flow Rate gpm	Flow Rate gpm/in²	Net ΔP psid
400 x 400	71	0	0	0.2	0.126	0.025
		65	41.34			0.045
		130	82.37			0.075
		195	123.11			0.125
		260	164.14			0.275
		325	205.18			3.02
		355	224.22			6.32
		385	243.[illegible]			11.73
		415	261.39			15.73
		445	280.93			2[illegible].93
		475	299.[illegible]			26.43
		505	318.8[illegible]			32.93
		535	337.75			39.93
	70	0	0	0.458	0.289	0.07
		50	31.57			0.09
		100	63.13			0.11
		150	94.70			0.14
		200	126.26			0.46
		250	157.83			2.84
		300	189.39			12.69
		320	202.02			20.19
		340	214.65			28.29
		360	227.27			36.89
		380	239.90			49.39
	73	0	0	3.5	2.21	0.09
		50	31.57			0.21
		100	63.13			0.58
		150	94.70			3.71
		180	113.64			15.26
		190	119.95			26.26
		200	126.26			40.26
	76	0	0	10.4	6.57	0.37
		30	18.94			0.63
		60	37.88			1.12
		90	56.82			2.15
		120	75.76			4.75
		135	85.23			8.30
		150	94.70			16.80
		165	104.17			38.30
635 x 635	70	0	0	0.2	0.126	0.015
		30	18.94			0.025
		60	37.88			0.105
		90	56.82			0.305
		120	75.76			1.23
		150	94.70			3.23
		180	113.64			6.73
		210	132.58			11.78
		240	151.52			16.78
		270	170.46			22.78
		300	189.39			28.98
		330	208.33			34.98
		360	227.27			41.98
	73	0	0	3.5	2.21	0.18
		30	18.94			0.41
		60	37.88			1.25
		90	56.82			5.86
		120	75.76			24.86
		135	85.23			[illegible]5.86
	71	0	0	10.4	6.57	0.6
		20	12.63			1.1
		40	25.25			2.2
		60	37.88			4.6
		70	44.19			7.3
		80	50.51			13.7
		90	56.82			26.3
		95	59.97			36.1
		100	63.13			51.8
508 x 508	70	0	0	0.2	0.126	0.035
		50	31.57			0.055
		100	63.13			0.375
		150	94.70			2.98
		200	126.26			9.28
		220	138.89			13.08
		240	151.52			16.98
		260	164.16			22.58
		280	176.79			27.48
		300	189.40			31.98
		320	202.03			36.98
		340	214.63			43.28
	74	0	0	3.5	2.21	0.18
		50	31.57			0.71
		100	63.13			8.16
		120	75.76			16.06
		140	88.38			28.06
		152	95.96			42.26
	74	0	0	10.4	6.57	0.6
		30	18.94			1.4
		60	37.88			3.4
		75	47.35			3.6
		90	56.82			11.5
		105	66.29			28.1
		110	69.44			39.3
850 x 850	72	0	0	0.2	0.125	0.13
		30	18.94			0.16
		60	37.88			0.25
		90	56.82			0.48
		120	75.76			1.20
		150	94.70			[illegible].18
		180	113.64			[illegible].68
		210	132.58			14.18
		240	151.52			20.49
		270	170.45			26.98
		300	189.40			36.08
		330	208.33			41.48
	73	0	0	3.5	2.21	0.14
		20	12.63			0.34
		40	25.25			1.01
		60	37.88			[illegible].80
		80	50.51			[illegible]
		90	56.82			[illegible]
		100	63.13			[illegible]
		110	69.44			[illegible]
		115	72.6[illegible]			[illegible]
	73	0	0	10.4	6.57	0.8
		10	6.31			1.2
		20	12.63			1.6
		30	18.94			2.3
		40	25.25			3.4
		50	31.57			4.9
		60	37.88			6.2
		70	44.19			15.3
		80	50.51			31.3
		90	56.82			61.3

TABLE B-14

CONTAMINANT TOLERANCE OF SINTERED METAL FIBER FELT

DYNALLOY X

Fluid: Deionized Water @ 68°F
Contaminant: AC Coarse Dust
Flow Rate: 2.21 gpm/in^2

Grade Designation	Add Size mg	Accum Add mg	Accum Add mg/in^2	Net ΔP psi
Dynalloy X-7	0	0	0	1.0
	15	15	9.47	1.11
	15	30	18.94	1.26
	15	45	28.41	1.46
	15	60	37.88	1.76
	15	75	47.35	2.26
	15	90	56.82	3.26
	15	105	66.29	5.92
	15	120	75.76	11.26
	15	135	85.23	22.56
	15	150	94.70	43.26
Dynalloy X-11	0	0	0	0.59
	20	20	12.[illegible]3	0.74
	20	40	25.[illegible]	0.96
	20	60	32.88	1.26
	20	80	50.51	1.86
	20	100	63.13	3.46
	20	120	75.76	7.61
	20	140	88.38	17.96
	20	160	101.01	40.26
Dynalloy X-13	0	0	0	0.41
	50	50	31.57	0.66
	50	100	63.13	1.41
	50	150	94.7	6.51
	50	200	126.3	48.76
Dynalloy X-5	0	0	0	5.16
	5	5	3.16	5.66
	5	10	6.31	6.31
	5	15	9.47	7.11
	5	20	12.63	7.96
	5	25	15.78	8.91
	5	30	18.94	10.56
	5	35	22.10	12.86
	5	40	25.25	15.56
	5	45	28.41	19.86
	5	50	31.57	26.26
	5	55	34.72	35.26
	5	60	37.88	47.26
Dynalloy X-4	0	0	0	9.96
	5	5	3.61	10.66
	5	10	6.31	11.46
	5	15	9.47	12.16
	5	20	12.63	13.26
	5	25	15.78	14.56
	5	30	18.94	16.16
	5	35	22.10	18.26
	5	40	25.25	21.06
	5	45	28.41	24.56
	5	50	31.57	28.76
	5	55	34.72	35.76
	5	60	37.88	47.56
Dynalloy X-3	0	0	0	25.86
	5	5	3.61	29.26
	5	10	6.31	31.76
	5	15	9.47	35.26
	5	20	12.63	39.56

TABLE B-15

CONTAMINANT TOLERANCE OF TDDW USING MIL-H-5606 HYDRAULIC FLUID

Contaminant: AC Coarse Dust

Type of Screen	Flow Rate gpm	Flow Rate gpm/in^2	Add Size mg.	Accum. Adds mg.	Accum. Adds mg/in^2	ΔP, psid	Temp °F
165X400	0.2	0.126	0	0	0	0.86	96
			20	20	12.63	1.37	97
			20	40	25.25	2.76	98
			20	60	37.88	7.57	99
			20	80	50.51	20.26	100
			5	85	53.66	27.96	101
			5	90	56.82	35.76	102
			5	95	59.97	45.26	103
	0.458	0.289	0	0	0	1.42	114
			15	15	9.47	2.18	115
			15	30	18.94	3.95	115
			15	45	28.41	8.35	116
			15	60	37.88	21.45	117
			5	65	41.04	29.35	118
			5	70	44.19	38.85	118
			5	75	47.35	48.85	119
	3.5	2.21	0	0	0	8.1	118
			10	10	6.3	10.6	120
			10	20	12.6	14.6	124
			10	30	18.9	22.1	125
			10	40	25.2	34.8	126
			10	50	31.5	57.3	128
200X1400	0.2	0.126	0	0	0	1.56	105
			20	20	12.62	2.86	108
			20	40	25.25	7.86	110
			20	60	37.88	23.56	111
			5	65	41.04	32.26	112
			5	70	44.19	43.56	113
	0.458	0.289	0	0	0	2.75	110
			10	10	6.31	3.70	112
			10	20	12.62	5.37	113
			10	30	18.94	7.85	115
			10	40	25.25	13.35	117
			10	50	31.57	19.25	119
			10	60	37.88	35.05	120
			5	65	41.04	47.55	121
	3.5	2.21	0	0	0	15.7	110
			10	10	6.3	23.0	114
			5	15	9.5	28.6	118
			5	20	12.6	38.8	120
			5	25	15.8	51.8	123
325X2300	0.2	0.126	0	0	0	2.51	95
			20	20	12.63	6.41	97
			20	40	25.25	18.06	98
			5	45	28.41	28.26	99
			5	50	31.57	41.76	100
			5	55	34.73	61.76	101
	0.458	0.289	0	0	0	4.45	100
			10	10	6.31	6.30	106
			10	20	12.62	9.85	108
			10	30	18.94	16.35	109
			5	35	22.10	22.75	110
			5	40	25.25	29.25	111
			5	45	28.41	39.60	112
	3.5	2.21	0	0	0	26.3	106
			2	2	1.26	28.3	107
			2	4	2.53	30.3	108
			2	6	3.79	33.8	110
			2	8	5.05	37.3	112
			2	10	6.31	41.7	116

TABLE B-16

CONTAMINANT TOLERANCE OF PDCW USING MIL-H-5606 HYDRAULIC FLUID

Contaminant: AC Coarse Dust

Type of Screen	Flow Rate gpm	Flow Rate gpm/in²	Add Size mg.	Accum. Adds mg.	Accum. Adds mg/in²	ΔP, psid	Temp °F
30X150	0.2	0.126	0	0	0	0.06	110
			65	65	41.04	0.06	112
			65	130	82.07	0.10	114
			65	195	123.11	0.14	115
			65	260	164.14	0.22	116
			65	325	205.18	1.91	117
			65	390	246.21	15.76	118
			30	420	265.15	38.76	119
	0.458	0.289	0	0	0	0.2	98
			50	50	31.57	0.2	99
			50	100	63.13	0.25	100
			50	150	94.70	0.33	101
			50	200	126.26	0.41	102
			50	250	157.83	0.60	103
			50	300	189.39	1.40	104
			50	350	220.96	5.05	105
			30	380	239.90	18.35	105
			30	410	258.84	57.55	105
	3.5	2.21	0	0	0	0.6	106
			50	50	31.57	0.7	110
			50	100	63.13	0.8	112
			50	150	94.70	1.0	114
			50	200	126.26	1.35	116
			50	250	157.83	2.05	118
			50	300	189.39	3.93	120
			50	350	220.96	10.3	122
			15	365	230.43	16.1	124
			15	380	239.90	27.3	126
			15	395	249.37	47.8	128
30X400	0.2	0.126	0	0	0	0.19	90
			50	50	31.57	0.24	92
			50	100	63.13	0.96	94
			50	150	94.7	6.14	96
			50	200	126.26	28.26	97
			30	230	145.20	60.76	98
	0.458	0.289	0	0	0	0.35	113
			30	30	18.94	0.45	114
			30	60	37.88	0.70	115
			30	90	56.82	1.65	116
			30	120	75.76	5.30	117
			30	150	94.70	17.55	118
			15	165	104.17	31.55	119
			15	180	113.64	52.05	120
	3.5	2.21	0	0	0	1.45	100
			20	20	12.63	1.85	102
			20	40	25.25	2.60	104
			20	60	37.88	4.30	106
			20	80	50.51	7.95	108
			20	100	63.13	16.30	111
			20	120	75.76	38.6	114
2X120X650	0.2	0.126	0	0	0	0.29	108
			30	30	18.94	0.60	109
			30	60	37.88	2.46	110
			30	90	56.82	10.76	111
			15	105	66.29	20.95	112
			15	120	75.76	30.78	113
			15	135	85.23	44.00	114
	0.458	0.289	0	0	0	0.55	114
			20	20	12.63	0.80	115
			20	40	25.25	2.65	116
			20	60	37.88	3.55	117
			20	80	50.51	8.05	119
			20	100	63.13	18.45	121
			10	110	69.44	27.65	122
			10	120	75.76	38.55	123
			5	125	78.91	47.55	123
	3.5	2.21	0	0	0	3.6	100
			10	10	6.31	4.6	102
			10	20	12.63	6.4	104
			10	30	18.94	9.5	106
			10	40	25.25	14.5	108
			10	50	31.57	24.0	111
			10	60	37.88	40.3	114
165X800	0.458	0.289	0	0	0	0.5	116
			20	20	12.63	0.7	117
			20	40	25.25	0.9	118
			20	60	37.88	2.1	119
			20	80	50.51	5.1	120
			20	100	63.13	16.0	121
			10	110	69.44	27.5	121
			10	120	75.76	42.5	122
			5	125	78.91	54.0	123
	3.5	2.21	0	0	0	2.9	114
			10	10	6.31	4.0	115
			10	20	12.63	6.4	117
			10	30	18.94	9.1	118
			10	40	25.25	15.0	120
			10	50	31.57	22.4	122
			10	60	37.88	38.9	124
			10	70	44.19	60.0	125

TABLE B-17

CONTAMINANT TOLERANCE OF TDDW WIRE CLOTH USING JP-4

Contaminant: AC Coarse Dust
Screen Area: 1.584 in^2

Type of Screen	Flow Rate gpm	Flow Rate gpm/in^2	Add Size mg.	Accum. Adds mg	Accum. Adds mg/in^2	ΔP, psid	Temp °F
325X2300	3.5	2.21	0	0	0	2.41	73
			10	10	6.31	4.14	
			10	20	12.63	8.24	
			10	30	18.94	20.29	
			5	35	22.10	33.29	
			5	40	25.25	52.79	
	0.458	0.289	0	0	0	0.28	71
			20	20	12.63	1.3	
			20	40	25.25	4.25	
			20	60	37.88	9.4	
			20	80	50.51	15.4	
			20	100	63.14	21.4	
			20	120	75.76	27.9	
			20	140	88.38	33.9	
			20	160	101.01	39.9	
	0.2	0.126	0	0	0	0.27	71
			50	50	31.57	0.77	
			50	100	63.13	1.82	
			50	150	94.70	3.47	
			50	200	126.26	5.17	
			50	250	151.52	6.97	
			50	300	189.39	9.37	
			50	350	220.96	11.77	
			50	400	252.53	14.17	
			50	450	284.09	17.47	
			50	500	315.66	19.57	
			50	550	347.22	21.97	
			50	600	378.79	24.47	
			50	650	410.35	26.97	
			50	700	441.92	29.77	
			50	750	473.48	32.47	
			50	800	505.05	35.27	
			50	850	536.62	37.97	
			50	900	568.18	40.97	

Type of Screen	Flow Rate gpm	Flow Rate gpm/in^2	Add Size mg.	Accum. Adds mg	Accum. Adds mg/in^2	ΔP, psid	Temp °F
165X1400	3.5	2.21	0	0	0	1.11	74
			10	10	6.31	1.49	
			10	20	12.63	2.09	
			10	30	18.94	3.29	
			10	40	25.25	6.04	
			10	50	31.57	11.99	
			10	60	37.88	23.79	
			10	70	44.19	45.79	
	0.458	0.289	0	0	0	0.13	72
			30	30	18.94	0.92	
			30	60	37.88	3.55	
			30	90	56.82	7.9	
			30	120	75.76	13.4	
			30	150	94.70	19.4	
			30	180	113.64	26.2	
			30	210	132.58	33.9	
			30	240	151.52	43.4	
	0.2	0.126	0	0	0	0.07	
			65	65	41.04	1.27	
			65	130	82.07	2.62	
			65	195	123.11	4.47	
			65	260	164.14	6.22	
			65	325	205.18	9.22	
			65	390	246.21	11.57	
			65	455	287.25	14.77	
			65	520	328.28	17.77	
			65	585	369.32	20.77	
			65	650	410.35	23.97	
			65	715	451.39	26.47	
			65	780	492.42	29.97	
			65	845	533.46	32.47	
			65	910	574.49	35.47	
			65	975	615.53	38.47	
			65	1040	656.57	41.87	
			65	1105	697.60	44.97	

TABLE II-1*

CONTAMINANT TOLERANCE OF [illegible] WIRE CLOTH [illegible] JP-5

Contaminant: AC Coarse Dust
Screen Area: 1.[illegible] in²

Type of Screen	Flow Rate gpm	Flow Rate gpm/in²	Add Size mg.	Accum. Adds mg.	Accum. Adds mg/in²	ΔP, psid	Temp °F
30X150	3.5	2.21	0	0	0	0.39	[illegible]
			50	50	31.57	[illegible]	
			50	100	63.13	[illegible]	
			50	150	94.70	[illegible]	
			50	200	[illegible]	[illegible]	
			50	250	[illegible]	[illegible]	
			50	300	[illegible]	[illegible]	
			50	350	[illegible]	2.12	
			50	400	[illegible]	[illegible]	
			50	450	[illegible]	[illegible]	
	0.458	0.289	0	0	0	[illegible]	72
			100	100	63.13	0.24	
			100	200	126.26	[illegible]	
			100	300	189.39	[illegible]	
			100	400	252.52	[illegible]	
			100	500	315.66	[illegible]	
			50	550	347.22	3.0	
			50	600	378.79	16.6	
			50	650	410.35	24.9	
			50	700	441.92	36.1	
						-6.9	
	0.2	0.126	0	0	0	0.01	74
			100	100	63.13	0.01	
			100	200	126.26	0.02	
			100	300	189.39	0.03	
			100	400	252.53	0.10	
			100	500	315.66	0.17	
			100	600	378.79	0.32	
			100	700	441.92	0.51	
			100	800	505.05	2.10	
			100	900	568.18	6.40	
			100	1000	631.31	10.90	
			100	1100	694.44	15.60	
			100	1200	757.58	21.10	
			100	1300	820.71	26.20	
			100	1400	883.84	30.90	
			100	1500	946.97	[illegible]	
			100	1600	1010.10	41.90	
			100	1700	1073.23	48.20	
155X800	3.5	2.21	0	0	0	0.3	73
			20	20	12.63	0.91	
			20	40	25.25	1.79	
			20	60	37.88	6.09	
			20	80	50.51	12.19	
			20	100	63.13	21.49	
			20	120	75.76	45.19	
	0.458	0.289	0	0	0	0.07	73
			40	40	25.25	0.23	
			40	80	50.51	0.57	
			40	120	75.76	1.12	
			40	160	101.01	3.57	
			40	200	126.26	7.87	
			40	240	151.52	16.07	
			40	280	176.77	33.47	
			20	300	189.39	47.37	

Type of Screen	Flow Rate gpm	Flow Rate gpm/in²	Add Size mg.	Accum. Adds mg.	Accum. Adds mg/in²	ΔP, psid	Temp °F
2X120X650	3.5	2.21	0	0	0	0.44	74
			20	20	12.63	0.59	
			20	40	25.25	[illegible]	
			20	60	37.88	6.79	
			20	80	50.51	19.49	
			10	90	[illegible]	34.79	
			10	100	63.13	58.29	
	0.458	0.289	0	0	0	0.05	73
			30	30	18.94	[illegible]	
			30	60	37.88	0.75	
			30	90	56.82	2.6	
			30	120	75.76	5.7	
			30	150	94.70	9.3	
			30	180	113.64	13.4	
			30	210	132.58	17.9	
			30	240	151.52	23.2	
			30	270	170.45	27.9	
			30	300	189.39	32.9	
			30	330	208.33	40.2	
			30	360	227.27	45.9	
	0.2	0.126	0	0	0	0.02	73
			65	65	41.04	0.22	
			65	130	82.07	0.52	
			65	195	123.11	0.92	
			65	260	164.14	1.4	
			65	325	205.18	2.0	
			65	390	246.21	2.8	
			65	455	287.25	3.8	
			65	520	328.28	5.0	
			65	585	369.32	6.7	
			65	650	410.35	8.6	
			65	715	451.39	10.5	
			65	780	492.42	12.7	
			65	845	533.46	15.9	
			65	910	574.50	18.7	
			65	975	615.53	21.3	
			65	1040	656.57	23.7	
			65	1105	697.60	27.2	
			65	1170	738.64	30.1	
			65	1235	779.67	33.7	
			65	1300	820.71	36.7	
			65	1365	861.74	39.8	
			65	1430	902.78	42.3	
80X400	3.5	2.21	0	0	0	0.19	70
			30	30	18.94	0.29	
			30	60	37.88	0.49	
			30	90	56.82	1.1	
			30	120	75.76	2.8	
			30	150	94.70	9.8	
			30	180	113.64	36.8	
			10	190	119.95	51.8	
	0.458	0.289	0	0	0	0.03	73
			65	65	41.04	0.1	
			65	130	82.07	1.75	
			65	195	123.11	7.1	
			30	225	142.05	10.9	
			30	255	160.98	15.3	
			30	285	179.92	19.4	
			30	315	198.86	23.6	
			30	345	217.80	27.7	
			30	375	236.74	32.2	
			30	405	255.68	[illegible]	
			30	435	274.62	[illegible]	
	0.2	0.126	0	0	0	0.02	74
			100	100	63.13	0.07	
			100	200	126.26	[illegible]	
			100	300	189.39	1.02	
			100	400	252.53	2.7	
			100	500	315.66	5.1	
			100	600	378.79	7.6	
			100	700	441.92	10.5	
			100	800	505.05	13.5	
			100	900	568.18	16.7	
			100	1000	631.31	20.2	
			100	1100	694.44	23.8	
			100	1200	757.58	27.1	
			100	1300	820.71	30.5	
			100	1400	883.84	34.3	
			100	1500	946.97	38.0	
			100	1600	1010.10	42.0	

TABLE B-19

CONTAMINANT TOLERANCE OF TDDW USING ETHYLENE GLYCOL AND WATER

(35%/65% by Weight)

Contaminant: AC Coarse Dust

Type of Screen	Flow Rate gpm	Flow Rate gpm/in^2	Add Size mg.	Accum. Adds mg.	Accum. Adds mg/in^2	ΔP, psid	Temp °F
165 x 1400 TDDW	0.458	0.289	0	0	0	0.3	75
			15	15	9.47	0.4	
			15	30	18.94	0.95	
			15	45	28.41	2.01	
			15	60	37.88	4.1	
			15	75	47.35	8.15	
			15	90	56.82	17.15	
			10	100	63.13	27.0	
			10	110	69.44	42.1	
			10	120	75.76	60.5	
	3.5	2.21	0	0	0	2.12	73
			15	15	9.47	3.54	
			15	30	18.94	7.12	
			15	45	28.41	18.22	
			5	50	31.57	26.92	
			5	55	34.72	38.72	
			5	60	37.88	58.72	
325 x 2300	0.20	0.126	0	0	0	0.40	67
			15	15	9.47	0.50	
			15	30	18.94	2.3[illegible]	
			15	45	28.41	6.[illegible]0	
			15	60	37.88	14.10	
			15	75	47.35	25.3	
			15	90	56.82	38.1	
			10	100	63.13	50.8	
	0.458	0.289	0	0	0	0.45	67
			10	10	6.31	1.05	
			10	20	12.63	2.60	
			10	30	18.94	7.15	
			10	40	25.25	16.3	
			10	50	31.57	32.0	
			10	60	37.88	56.0	
	3.5	2.21	0	0	0	7.85	69
			5	5	3.16	11.50	
			5	10	6.31	17.15	
			5	15	9.47	25.85	
			5	20	12.63	39.75	
			5	25	15.78	60.75	
	10.4	6.57	0	0	0	28.9	72
			3	3	1.89	35.9	
			1	4	2.53	38.9	
			2	6	3.8	44.9	
			2	8	5.05	52.9	

TABLE B-20

CONTAMINANT TOLERANCE OF PLAIN DUTCH SINGLE WEAVE WIRE CLOTH

Fluid: Ethylene Glycol & Water (35%/65% by Weight)
Contaminant: AC Coarse Dust

Grade of Screen	Temp °F	Contaminant Accum. Adds mg.	Contaminant Accum. Adds mg/in²	Flow Rate gpm	Flow Rate gpm/in²	Net ΔP psid
30 x 150	70	0 65 130 195 260 325 390 455 470 485 500 515 530	0 41.04 82.09 123.11 164.14 205.18 246.21 287.25 296.72 306.19 315.66 325.13 334.6	0.2	0.126	0.03 0.03 0.03 0.03 0.05 0.07 0.25 7.1 13.0 18.6 28.4 38.4 48.4
	70	0 65 130 195 260 325 390 455 470 485	0 41.04 82.07 123.11 164.14 205.18 246.21 287.25 296.72 306.19	0.458	0.289	0.05 0.05 0.05 0.05 0.05 0.05 3.8 20.3 35.5 48.0
	71	0 50 100 150 200 250 300 350 365 380 395 410 425	0 31.57 63.13 94.70 126.26 157.83 189.39 220.56 230.43 235.90 249.37 258.84 268.31	3.5	2.21	0.11 0.15 0.18 0.25 0.38 0.65 1.26 3.55 5.60 10.05 19.55 35.75 67.75
	73	0 50 100 150 200 250 300 350 365 380 395 410	0 31.57 63.13 94.70 126.26 157.83 189.39 220.96 230.43 239.90 249.37 258.84	10.4	6.57	0.57 1.11 1.40 1.75 2.35 3.40 5.50 11.10 14.70 20.60 30.40 49.90

Grade of Screen	Temp °F	Contaminant Accum. Adds mg.	Contaminant Accum. Adds mg/in²	Flow Rate gpm	Flow Rate gpm/in²	Net ΔP psid
80 x 400	73	0 50 100 150 200 230 260 275	0 31.57 63.13 94.70 126.26 145.20 164.14 173.61	0.2	0.126	0.2 0.2 0.7 3.0 14.2 27.9 47.9 61.9
	69	0 30 60 90 120 150 165 180	0 18.94 37.87 56.82 75.76 94.70 104.17 113.64	0.458	0.289	0.2 0.3 0.4 0.75 3.75 17.0 31.0 49.5
	74	0 20 40 60 80 100 110 120 130	0 12.63 25.25 37.88 50.51 63.13 69.44 75.76 82.07	3.5	2.21	0.37 0.62 0.97 1.92 4.02 9.42 15.42 25.22 48.22
		0 15 30 45 60 75 80 85 90 95	0 9.47 18.94 28.41 37.88 47.35 50.51 53.66 56.82 59.97	10.4	6.57	1.45 1.95 2.85 4.57 7.6 14.7 19.2 25.7 34.9 48.9
165 x 800	70	0 30 60 90 120 150 180 210 240 270 300 315 330 345 360	0 18.94 37.88 56.82 75.76 94.70 113.64 132.58 151.52 170.45 189.39 198.86 208.33 217.80 227.27	0.2	0.126	0.05 0.15 0.26 0.60 0.80 1.25 2.0 3.2 7.5 15.1 25.2 31.4 38.1 44.9 54.1
	69	0 30 60 90 105 120 135	0 18.94 37.88 56.82 66.29 75.76 85.23	0.458	0.289	0.1 0.3 1.9 10.2 20.0 34.0 54.0
	71	0 15 30 45 60 75 90	0 9.47 18.94 28.41 37.89 47.35 56.82	3.5	2.21	0.75 1.25 2.45 5.38 11.45 25.55 52.05
	73	0 10 20 30 40 50 55	0 6.31 12.63 18.94 25.25 31.57 34.72	10.4	6.57	2.8 3.75 6.2 10.3 18.2 32.9 45.9

Grade of Screen	Temp °F	Contaminant Accum. Adds mg.	Contaminant Accum. Adds mg/in²	Flow Rate gpm	Flow Rate gpm/in²	Sys ΔP PSID
2x120x650 PDSW	70	0 10 20 30 40 45	0 6.31 12.63 18.94 25.25 28.41	10.4	6.57	3.05 5.71 9.20 10.90 31.90 [illegible]
	70	0 15 30 45 60 65 70 75	0 9.47 18.94 28.41 37.88 41.04 44.19 47.35	3.5	2.21	0.72 1.34 2.97 7.37 17.72 24.92 37.72 50.22
	70	0 30 60 90 105 120 125	0 18.94 37.88 56.82 66.20 75.76 78.92	0.458	0.289	0.02 0.32 2.15 10.00 18.40 20.60 31.00
	70	0 30 60 90 120 150 180 210	0 18.94 37.88 56.82 75.76 94.70 113.64 132.58	0.2	0.126	0.01 0.06 0.60 3.52 11.46 22.30 31.90 40.90
30x160 PDSW	72	0 50 100 150 200 250 300 350 365	0 31.57 63.13 94.70 126.26 157.83 189.39 220.96 230.43	10.4	6.57	0.70 0.85 1.10 1.70 2.35 3.90 7.90 27.40 51.90
	71	0 50 100 150 200 250 300 350 365	0 31.57 63.13 94.70 126.26 157.83 189.39 220.96 230.43	3.5	2.21	0.12 0.14 0.18 0.32 0.47 0.92 2.72 16.60 47.20
	71	0 65 130 195 260 325 390 455	0 41.04 82.07 123.11 164.14 205.18 246.21 287.25	0.458	0.289	0.05 0.05 0.05 0.05 0.05 0.30 6.00 44.80
	71	0 65 130 195 260 325 390 455 470 485 500 515 530	0 41.04 82.07 123.11 164.14 205.18 246.21 287.25 296.72 306.19 315.66 325.13 334.60	0.2	0.126	0.03 0.33 0.03 0.03 0.03 0.05 0.80 11.40 19.50 24.70 31.40 37.40 43.40

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

TABLE B-25

CONTAMINANT TOLERANCE OF TDDW WIRE CLOTH USING GASEOUS OXYGEN

Contaminant: AC Coarse Dust

Grade Of Screen	Test No	Screen Area in²	Avg. Flowrate SCIM/in²	Inlet Press psia	Add. mg.	Accum. Add mg.	Accum. Add mg/in²	Net ΔP, psid
325 x 2300 TDDW	25	0.3167	2.02	51.3	21.1	21.1	66.6	0.848
			2.70	53.2	44.9	66.0	208	2.698
			2.36	48.7	100.6	166.0	524	6.602
			2.60	50.8	99.4	265.4	839	10.979
			2.70	51.3	198.0	463.4	1463	22.585
			2.52	48.7	99.4	562.8	1777	26.752
			2.02	53.2	97.7	660.5	2086	31.284
	26	0.3349	5.21	49.3	23.7	23.7	70.8	2.711
			5.19	54.3	48.6	72.3	216	9.080
			5.18	50.0	100.1	172.4	515	14.979
			5.14	49.3	100.1	272.5	814	25.955
			5.10	51.9	49.5	322.0	961	37.495
	27	0.3349	13.59	50.0	4.8	4.8	14.3	2.058
			13.81	48.7	10.4	15.2	45.4	12.775
			14.47	51.9	4.5	19.7	58.8	17.010
			14.53	51.9	5.0	24.7	73.8	20.829
			14.37	52.6	9.8	34.5	103	29.559
			13.91	52.6	4.7	39.2	117	31.083
	28	0.3349	18.58	395.4	54.2	54.2	162	2.527
			20.13	400.4	101.1	155.3	464	8.728
			20.31	401.7	100.6	255.9	764	13.455
			20.10	400.4	98.8	354.7	1059	20.635
			20.92	398.5	99.9	454.6	1357	27.466
			20.30	400.4	99.0	553.6	1653	33.353
			20.52	400.4	101.0	654.6	1955	40.761
			20.34	400.4	100.2	754.8	2254	47.691
	29	0.3167	43.39	401.2	10.9	10.9	34.4	6.052
			43.02	401.2	9.6	20.5	64.7	10.566
			42.63	399.9	10.1	30.6	96.6	13.394
			42.32	398.6	19.3	49.9	158	17.627
			41.81	398.6	50.6	100.5	317	28.468
			43.34	399.3	19.0	119.5	377	34.941
			42.97	401.2	20.9	140.4	443	40.979
			41.83	397.4	19.6	160.0	505	45.001
			42.75	370.2	8.8	168.8	533	46.738
	30	0.3349	106.61	401.5	5.1	5.1	15.2	14.245
			107.35	403.4	6.1	11.2	33.4	32.379
			107.67	400.0	5.7	16.9	50.5	46.187
165 x 1400 TDDW	19	0.3167	2.57	50.5	99.4	99.4	314	3.031
			2.63	51.8	99.6	199.0	628	6.149
			2.28	[illegible]	203.2	402.2	1270	12.284
			2.43	49.7	198.4	600.6	1896	22.727
			2.39	49.9	99.6	700.2	2211	31.759
			2.67	51.2	50.5	750.7	2370	37.279
			2.50	[illegible]	48.7	799.4	2524	39.165
	20	0.3167	5.25	49.3	100.1	100.1	316	4.999
			5.34	51.3	100.9	201.0	635	12.800
			5.04	[illegible]	50.4	251.4	794	19.113
			5.19	50.9	20.5	271.9	859	22.510
			5.39	51.3	50.2	322.1	1017	29.028
			4.99	51.3	48.8	370.9	1171	36.877
	22A	0.3349	21.05	403.9	0	0	0	1.509
			21.13	400.4	50.3	50.3	150	3.704
			21.82	401.1	48.1	98.4	294	6.306
			20.70	399.8	49.4	147.8	441	7.657
			20.90	[illegible]	19.7	167.5	500	10.329
			19.99	[illegible]	17.3	211.8	541	15.519
			21.65	[illegible]	[illegible]	[illegible]	801	[illegible]
			21.32	401.7	100.1	369.3	1100	26.261
			20.12	397.9	99.5	467.8	1397	33.483
			20.11	[illegible]	102.0	567.5	1695	40.023
			19.27	[illegible]	99.2	667.0	1992	45.320
			20.05	[illegible]	99.9	764.9	2270	52.107
	23	0.3167	43.75	[illegible]	53.0	53.0	167	8.391
			43.82	[illegible]	48.4	101.4	320	18.572
			43.55	399.7	46.4	147.8	467	28.542
			42.18	400.9	47.9	195.7	619	40.304
			41.59	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	24	0.3349	107.42	[illegible]	5.9	[illegible]	17.6	[illegible]
			107.61	398.5	4.9	10.8	32.2	12.426
			107.34	397.9	5.0	15.8	47.2	26.263
			107.35	397.9	5.9	21.7	64.8	41.305
			107.35	397.3	4.2	25.9	77.3	50.793
80 x 700	13	0.3167	2.64	49.9	100.9	100.9	319	1.027
			2.67	49.9	100.1	201.0	635	4.461
			2.76	51.2	100.8	301.8	953	7.728
			2.52	48.0	100.0	401.8	1269	10.333
			2.63	49.3	99.9	501.7	1584	15.959
			2.80	52.5	46.7	548.4	1732	14.430
			2.75	51.8	50.3	598.7	1890	17.941
			2.77	50.5	100.3	699.0	2207	25.668
			2.65	49.9	99.9	798.9	2523	35.461
			2.73	51.3	48.9	847.8	2677	38.867
	13A	0.3349	2.45	48.6	99.8	99.8	298	2.770
			2.57	50.5	99.9	199.7	596	7.083
			2.64	51.2	50.3	250.0	746	10.079
			2.51	50.5	48.1	298.1	890	12.683
			2.53	49.9	99.6	397.7	1188	18.587
			2.53	49.3	100.1	497.8	1486	25.819
			2.82	49.3	100.0	597.8	1785	34.820
			2.63	52.5	50.3	648.1	1935	39.81[illegible]
	14	0.3167	5.44	51.3	100.3	100.3	317	5.641
			5.17	50.6	49.4	149.7	473	11.564
			5.32	51.3	20.7	170.4	538	14.821
			5.21	50.6	21.6	192.0	606	18.298
			5.16	50.0	19.4	211.4	668	21.470
			5.19	50.0	20.9	232.3	734	24.886
			5.25	51.3	49.8	282.1	891	35.146
			5.06	50.6	9.8	291.9	922	39.043
	15	0.3349	14.13	51.2	18.1	18.1	54.0	1.028
			13.97	48.0	18.4	36.5	109	3.210
			13.21	49.3	18.7	55.2	165	20.440
			15.20	55.2	4.8	60.0	179	31.191
	15A	0.3349	13.82	51.2	19.3	19.3	57.6	0.921
			15.50	49.9	10.8	30.1	89.9	2.356
			15.10	48.6	10.2	40.3	120	6.857
			13.04	48.6	4.2	44.5	133	14.741
			15.70	51.2	5.1	49.6	148	24.775
			12.02	51.2	4.6	54.2	162	27.548
	16A	0.3349	21.10	596.7	98.6	98.6	294	7.0385
			21.46	400.5	54.1	152.7	456	11.432
			21.45	400.5	45.4	198.1	592	15.882
			21.50	398.0	100.1	298.2	890	20.276
			22.31	399.9	98.9	397.1	1186	29.370
			20.99	399.9	100.0	497.1	1484	28.742
			21.47	400.5	99.6	596.7	1782	42.467
			21.64	401.9	49.6	646.3	1930	48.849
	17	0.3167	41.74	402.8	10.9	10.9	34.4	0.807
			42.06	402.8	20.0	30.9	97.6	6.487
			42.05	402.8	20.3	51.2	162	15.963
			42.36	600.9	9.2	60.4	191	18.841
			41.86	399.0	10.2	70.6	223	21.494
			42.55	101.6	19.5	90.1	284	26.400
			42.64	400.6	52.0	142.1	449	37.686
			41.59	404.1	20.9	163.0	515	45.028
			41.16	400.9	9.7	172.7	545	47.061
	18	0.3349	106.32	397.4	5.5	5.5	16.4	3.864
			106.97	398.0	4.9	10.4	31.1	5.332
			107.07	397.4	6.0	16.4	49.0	9.062
			106.58	396.7	5.3	21.7	64.8	14.771
			107.35	399.3	6.0	27.7	82.7	32.377
30 x 250 TDDW	7	0.3167	2.75	51.9	100.6	100.6	318	0.056
			2.51	50.1	197.6	298.2	942	7.409
			2.77	51.3	45.1	343.3	1085	10.567
			2.65	48.7	18.4	361.8	1133	12.093
			2.63	49.3	19.5	384.4	1214	12.993
			2.61	49.3	100.5	485.1	1532	16.087
			2.64	50.0	98.2	583.3	1842	25.577
			2.72	51.3	[illegible]	605.5	1912	29.018
			2.59	50.0	22.7	628.2	1984	30.406
			2.56	50.0	14.2	642.4	2028	33.701
			2.53	48.7	50.9	693.3	2189	34.387
	8A	0.3349	4.16	47.4	99.4	99.4	297	0.146
			4.50	51.9	48.1	147.5	440	0.272
			4.43	51.3	50.5	198.0	591	0.571
			4.40	50.6	20.0	218.0	651	0.344
			4.50	51.9	19.5	237.5	709	1.237
			4.44	51.9	20.1	257.6	769	2.274
			4.24	49.3	10.0	267.6	799	3.513
			4.30	49.3	9.2	276.8	827	5.791
			4.38	51.9	9.6	286.4	855	8.902
			4.31	50.6	10.7	297.1	887	13.778
			4.35	49.3	8.8	305.9	913	18.948
			3.86	50.6	10.2	316.1	944	28.426
			3.76	50.6	10.2	326.3	974	32.596
			4.21	51.8	9.2	335.5	1002	[illegible]
	8	0.3167	5.25	48.6	100.2	100.2	316	0.203
			5.08	48.0	100.3	200.5	633	1.009
			5.22	49.3	101.7	302.2	954	15.118
			5.01	48.0	18.7	320.9	1013	24.829
			5.36	51.2	11.0	331.9	1048	30.466
			5.36	51.2	10.3	342.2	1081	33.722
			5.49	51.8	10.2	352.4	1113	38.297
	9	0.3349	13.77	51.2	19.8	19.8	59.1	0.330
			15.73	50.5	10.5	30.3	90.5	0.378
			13.54	49.3	19.4	49.7	148	0.468
			13.99	51.2	19.0	68.7	205	0.497
			13.40	48.6	50.5	119.2	356	0.761
			13.57	49.3	49.7	168.9	504	2.087
			13.97	51.2	9.7	178.6	533	2.757
			13.75	49.9	9.7	188.3	562	3.452
			13.33	49.3	8.5	197.2	589	4.088
			13.59	50.5	9.8	207.0	618	5.440
			13.31	49.9	9.1	216.1	645	7.405
			13.94	51.8	9.1	225.2	672	10.569
			13.70	50.5	4.3	229.5	685	12.667
			13.09	48.0	9.0	238.5	712	16.751
			13.33	[illegible]	10.9	249.4	745	20.594
	10B	0.3167	20.44	399.8	50.9	50.9	161	6.128
			20.05	401.1	49.8	100.7	318	0.227
			19.51	397.9	51.0	151.7	479	0.431
			20.57	403.6	99.1	250.8	792	1.450
			19.82	403.1	19.5	270.3	853	1.795
			19.00	398.5	[illegible]	369.0	1165	10.282
			20.11	408.7	18.6	387.6	1224	9.566
			20.44	403.0	18.9	406.5	1284	17.134
			21.04	403.0	8.8	415.3	1311	22.270
			20.84	402.3	10.9	426.2	1346	21.226
			21.29	404.9	5.3	431.5	1362	26.750
			19.41	403.1	19.5	451.0	1424	25.926
			20.75	397.3	9.9	460.9	1455	26.606
			21.18	403.6	18.9	479.8	1515	28.481
			19.42	399.8	19.5	499.3	1577	23.522
			19.44	402.3	90.5	589.8	1862	27.651
			19.50	399.2	23.4	613.2	1936	34.226
			21.59	401.1	31.7	[illegible]	[illegible]	[illegible]
	11A	0.3167	42.77	402.1	99.9	99.9	315	0.674
			42.56	400.8	20.6	120.5	380	1.613
			41.74	403.4	22.9	143.4	453	2.337
			41.63	401.5	21.1	164.5	519	35.671
			41.70	403.4	44.0	208.5	658	47.251
			45.02	402.3	21.7	230.2	727	48.484

TABLE B-22

CONTAMINANT TOLERANCE OF 30 X 250 TDDW FLOWING GASEOUS HYDROGEN
CONTAMINANT: AC COARSE DUST-IRON PYRITE MIXTURE

Test No.	Avg Temp °F	Screen Area In²	Avg Flow Rate ACFM/In²	Avg Flow Rate SCFM/In²	Inlet Press psia	Add Mg	Cum Add Mg	Cum Add Mg/In²	Net ΔP psid
34	76.3	0.3349	1.57	5.18	49.2	0	0	0	.009
			1.58	5.37	50.5	198.3	198.3	592.1	10.224
			1.56	5.30	50.5	50.7	249.0	743.5	12.670
			1.56	5.18	49.2	51.4	300.4	897.0	12.558
			1.55	5.15	49.2	50.0	350.4	1046.3	17.552
			1.56	5.23	49.9	50.3	400.7	1196.5	19.935
			1.53	5.13	49.9	51.5	452.2	1350.3	22.657
			1.58	5.24	49.2	69.3	521.5	1557.2	28.157
			1.57	5.19	49.2	69.1	590.6	1763.5	33.074
			1.56	5.16	49.2	51.3	641.9	1916.7	38.923
			1.54	5.23	50.5	40.6	682.5	2037.9	41.157
33	79.4	0.3349	2.37	7.94	49.9	0	0	0	.005
			2.33	7.84	49.9	99.5	99.5	297.1	.016
			2.37	8.16	[illegible]	99.8	199.3	595.1	.047
			2.40	7.92	49.2	100.0	299.3	893.7	.495
			2.39	7.67	49.2	100.8	400.1	1194.7	9.244
			2.34	7.71	49.2	50.3	450.4	1344.9	15.576
			2.40	7.91	49.2	50.2	500.6	1494.8	19.761
			2.40	7.87	49.2	60.1	560.7	1674.2	24.220
			2.40	7.87	49.2	59.9	620.6	1853.1	31.325
			2.40	7.87	49.2	60.9	681.5	2034.9	38.998
			2.42	8.62	53.7	53.3	734.8	2194.1	44.809
35	86.1	0.3349	4.28	13.77	48.8	0	0	0	.018
			4.21	13.58	48.8	100.2	100.2	299.2	.087
			4.29	14.33	50.7	100.0	200.2	597.8	.226
			4.27	13.96	49.4	100.2	300.4	897.0	.574
			4.27	14.10	50.1	100.0	400.4	1195.6	4.679
			4.22	13.95	50.1	19.6	420.0	1254.1	14.286
			4.26	14.08	50.1	4.8	424.8	1268.4	16.057
			4.23	13.97	50.1	5.3	430.1	1284.3	16.446
			4.25	13.87	49.4	10.0	440.1	1314.1	21.371
			4.25	14.21	50.7	10.6	450.7	1345.8	24.381
			4.25	14.24	50.7	19.8	470.5	1404.9	34.174
			4.25	14.47	51.4	10.9	481.4	1437.4	33.347
			4.26	14.38	50.7	10.3	491.7	1468.2	39.570
33A	81.0	0.3349	2.38	7.62	48.6	0	0	0	.035
			2.32	7.53	49.2	99.6	99.6	297.4	.039
			2.31	7.59	49.9	100.2	199.8	596.6	.072
			2.34	7.77	50.5	99.7	299.5	894.3	.918
			2.35	7.90	51.1	60.8	360.3	1075.8	10.710
			2.36	8.10	52.4	40.0	400.3	1195.3	18.585
			2.38	7.88	50.5	20.0	420.3	1255.0	20.524
			2.35	7.89	51.1	20.1	440.4	1315.0	23.514
			2.32	7.90	51.8	20.9	461.3	1377.4	24.979
			2.35	7.88	51.1	41.5	502.8	1501.3	28.075
			2.37	7.95	51.1	49.6	552.4	1649.4	34.810
			2.34	7.99	51.8	29.4	581.8	1737.2	38.891
36	76.7	0.3349	2.19	59.18	401.4	0	0	0	.048
			2.16	58.15	399.5	149.1	149.1	445.2	.113
			2.14	58.18	405.2	99.9	249.0	743.5	.779
			2.18	59.03	403.3	49.0	298.0	889.8	6.164
			2.11	56.95	401.4	20.3	318.3	950.4	12.743
			2.20	59.29	400.7	10.3	328.6	981.2	16.202
			2.24	59.88	397.6	20.0	348.6	1010.9	21.875
			2.18	58.43	398.2	19.8	368.4	1100.0	23.428
			2.21	59.00	398.2	48.8	417.2	1245.7	31.767
			2.14	57.45	400.1	51.0	468.2	1398.0	37.699
			2.17	58.62	402.6	50.7	518.9	1519.4	46.999
38A	72.7	0.3349	3.78	102.09	397.2	0	0	0	.267
			3.72	99.56	394.0	99.8	99.8	298.0	.351
			3.73	100.27	396.5	50.1	149.9	447.6	.679
			3.70	98.98	394.7	21.1	171.0	510.6	1.052
			3.76	101.82	400.3	20.0	191.0	570.3	1.134
			3.77	101.53	398.4	20.0	211.0	630.0	2.766
			3.70	100.26	400.3	20.2	231.2	690.4	10.516
			3.71	100.73	401.6	10.1	241.3	720.5	18.782
			3.77	101.55	398.4	4.7	246.0	734.5	23.930
			3.75	100.58	395.9	6.5	252.5	754.0	33.389
			3.74	100.48	397.2	5.0	257.5	769.9	38.826
37A	75.0	0.3349	1.49	40.23	397.6	0	0	0	.052
			1.47	39.76	398.3	100.0	100.0	298.6	.080
			1.49	39.99	396.4	101.0	201.0	600.2	.723
			1.47	39.66	397.0	100.5	301.5	900.3	7.485
			1.47	39.23	392.6	18.9	320.4	956.7	11.701
			1.49	39.96	395.1	21.0	341.4	1019.4	12.004
			1.49	39.97	397.6	20.8	362.2	1081.5	13.527
			1.46	39.39	398.3	49.8	412.0	1230.2	17.128
			1.47	39.44	397.6	51.5	463.5	1384.0	21.000
			1.48	39.73	397.6	49.3	512.8	1531.2	24.647
			1.51	40.49	397.6	49.3	562.1	1678.4	28.484
			1.52	40.71	398.3	49.3	611.4	1825.6	32.512
			1.46	39.14	399.5	49.5	660.9	1973.4	33.977
			1.51	40.19	399.5	49.2	710.1	2120.3	28.209
			1.51	40.24	398.3	100.0	810.1	2418.9	39.151
			1.54	40.92	397.6	69.2	879.3	2625.6	31.518

TABLE B-23

CONTAMINANT TOLERANCE OF 80 X 700 IDDW FLOWING GASEOUS HYDROGEN

CONTAMINANT: AC COARSE DUST-IRON PYRITE MIXTURE

Test No.	Avg Temp °F	Screen Area In^2	Avg Flow Rate $ACFM/In^2$	Avg Flow Rate $SCFM/In^2$	Inlet Press psia	Add Mg	Cum Add Mg	Cum Add Mg/In^2	Net ΔP psid
40	64.6	0.3349	1.58	5.50	50.3	0	0	0	.014
			1.58	5.35	49.1	101.6	101.6	303.4	4.111
			1.62	5.42	48.4	49.8	151.4	452.1	6.340
			1.64	5.39	47.8	100.7	252.1	752.8	9.648
			1.63	5.85	52.3	101.2	353.3	1054.9	14.677
			1.59	5.59	51.0	100.4	453.7	1354.7	21.696
			1.62	5.67	51.0	101.2	554.9	1656.9	27.013
			1.61	5.70	51.6	100.4	655.3	1956.7	32.297
			1.65	5.75	51.0	30.8	686.1	2048.7	36.246
39	84.8	0.3349	2.50	8.11	48.6	0	0	0	.024
			2.53	8.15	48.6	49.7	49.7	148.4	.292
			2.53	8.16	48.6	50.1	99.8	298.0	2.430
			2.52	8.10	48.6	49.7	149.5	446.4	4.238
			2.60	8.25	48.0	72.2	221.7	662.0	8.264
			2.56	8.13	48.0	70.3	292.0	871.9	12.336
			2.56	8.23	48.6	70.1	362.1	1081.2	18.453
			2.54	8.17	48.6	60.1	422.2	1260.7	24.752
			2.53	8.14	48.6	50.3	472.5	1410.9	27.706
			2.52	8.32	49.9	59.8	532.3	1589.4	35.227
			2.52	8.32	49.9	50.1	582.4	1739.0	40.537
41	68.9	0.3349	3.95	13.31	49.6	0	0	0	.043
			3.96	13.33	49.6	21.6	21.6	64.5	.210
			3.91	13.68	51.5	19.2	40.8	121.8	2.729
			3.90	13.64	51.5	20.3	61.1	182.4	9.182
			3.96	13.80	50.9	19.4	80.5	240.4	12.435
			3.85	13.52	50.9	21.2	101.7	303.7	15.213
			3.88	13.52	50.9	20.4	122.1	364.6	17.904
			3.87	13.51	50.9	33.8	154.9	462.5	22.452
			3.79	13.12	50.9	39.9	194.8	581.7	27.603
			3.84	13.30	50.9	40.0	234.8	701.1	34.155
45	62.2	0.3349	1.48	41.21	401.5	0	0	0	.043
			1.46	40.68	401.5	55.0	55.0	164.2	4.075
			1.48	40.91	399.6	20.7	75.7	226.0	4.341
			1.50	41.14	398.3	51.3	127.0	379.2	7.159
			1.50	41.71	402.1	61.9	188.9	564.0	9.912
			1.47	40.42	399.6	102.0	290.9	868.6	10.331
			1.49	41.14	400.2	100.6	391.5	1169.0	16.747
			1.45	40.17	400.8	100.4	491.9	1468.8	22.271
			1.49	41.14	399.0	102.0	593.9	1773.4	17.993
			1.49	41.30	401.5	100.0	693.9	2072.0	27.617
			1.47	40.74	400.8	100.7	794.6	2372.7	35.531
			1.49	41.02	399.0	101.0	895.6	2674.2	31.433
			1.52	41.78	399.0	99.6	995.2	2971.6	32.437

Test No.	Avg Temp °F	Screen Area In^2	Avg Flow Rate $ACFM/In^2$	Avg Flow Rate $SCFM/In^2$	Inlet Press psia	Add Mg	Cum Add Mg	Cum Add Mg/In^2	Net ΔP psid
44	75.1	0.3349	3.75	101.37	399.7	0	0	0	.310
			3.73	100.13	397.8	9.9	9.9	29.6	.364
			3.76	100.53	396.5	20.9	30.8	92.0	4.357
			3.74	100.23	396.5	9.9	40.7	121.5	11.804
			3.71	99.54	397.8	5.8	46.5	138.8	14.526
			3.77	101.08	397.2	10.4	56.9	169.9	18.762
			3.77	101.17	397.8	10.0	66.9	199.8	22.224
			3.78	101.15	397.8	10.6	77.5	231.4	22.356
			3.79	101.32	397.2	10.1	87.6	261.6	27.481
			3.79	102.25	400.3	20.1	107.7	321.6	30.102
			3.79	101.98	399.1	20.2	127.9	381.9	35.736
			3.77	102.10	402.8	20.0	147.9	441.6	40.892
			3.76	102.09	402.8	20.9	168.8	504.0	45.217
43A	86.3	0.3349	1.50	40.49	401.4	0	0	0	.082
			1.49	40.03	402.0	21.2	21.2	63.3	.083
			1.47	39.24	400.1	19.7	39.9	119.1	.261
			1.46	39.00	402.0	19.9	59.8	178.6	1.201
			1.48	39.51	402.0	20.9	80.7	241.0	2.900
			1.50	39.99	402.0	51.3	132.0	394.1	5.811
			1.50	39.55	400.1	49.6	181.6	542.3	8.649
			1.51	39.99	400.1	51.0	232.6	694.5	11.597
			1.48	39.20	400.1	51.2	283.8	847.4	17.181
			1.50	39.68	400.1	49.3	333.1	988.6	21.454
			1.52	40.04	399.5	50.3	383.4	1144.8	12.264
			1.47	38.50	397.6	100.3	483.7	1444.3	12.183
42	77.2	0.3349	2.18	58.13	396.4	0	0	0	.078
			2.18	58.08	395.8	20.5	20.5	61.2	.200
			2.17	57.62	393.9	51.0	71.5	213.5	5.335
			2.19	57.90	393.9	34.4	105.9	316.2	8.464
			2.20	58.68	397.0	38.8	144.7	432.1	12.694
			2.16	57.69	397.0	40.7	185.4	553.6	16.678
			2.21	59.02	397.6	53.9	239.3	714.5	22.168
			2.17	58.19	398.3	51.7	291.0	868.9	25.056
			2.22	59.17	397.6	51.3	342.3	1022.1	31.593
			2.23	59.17	396.4	40.5	382.8	1143.0	34.288
			2.20	58.86	398.3	50.2	433.0	1292.9	39.568
			2.21	58.90	397.6	72.4	505.4	1509.1	47.306

TABLE B-43

CONTAMINANT TOLERANCE OF 165 X 1400 TDDW FLOWING GASEOUS HYDROGEN
CONTAMINANT: AC COARSE DUST-IRON PYRITE MIXTURE

Test No.	Avg Temp °F	Screen Area In^2	Avg Flow Rate ACFM/In^2	Avg Flow Rate SCFM/In^2	Inlet Press psia	Add Mg	Cum Add Mg	Cum Add Mg/In^2	Net ΔP psid
46	89.3	0.3349	1.58	5.20	49.3	0	0	0	.041
			1.65	5.08	46.7	49.6	49.6	148.1	.567
			1.65	5.27	48.6	48.8	98.8	295.0	1.088
			1.66	5.32	48.6	51.3	150.1	448.2	3.080
			1.62	5.20	48.6	47.9	198.0	591.2	3.775
			1.61	5.28	49.9	99.9	297.9	889.5	6.329
			1.65	5.47	50.5	100.4	398.3	1189.3	9.292
			1.60	5.16	49.3	99.8	498.1	1487.3	12.257
			1.65	5.32	49.3	100.4	598.5	1787.1	16.681
			1.60	5.38	51.2	149.2	747.7	2232.6	24.194
			1.63	5.33	49.9	148.8	896.5	2676.9	33.426
			1.57	5.22	50.5	50.8	947.3	2828.6	34.115
			1.61	5.34	50.5	49.3	996.6	2975.8	40.904
45	90.4	0.3349	2.57	8.23	48.6	0	0	0	.015
			2.54	8.26	49.3	50.3	50.3	150.2	3.490
			2.55	8.16	48.6	50.2	100.5	300.1	6.154
			2.55	8.14	48.6	50.7	151.2	451.5	9.472
			2.55	8.14	48.6	50.0	201.2	600.8	13.236
			2.55	8.12	48.6	50.8	252.0	752.5	15.475
			2.54	8.09	48.6	49.9	321.9	961.2	19.672
			2.59	8.11	48.0	70.8	392.7	1172.6	23.453
			2.53	8.03	48.0	70.7	463.4	1383.7	28.085
			2.53	8.36	50.5	70.0	534.0	1594.5	40.238
47	64.8	0.3349	4.15	14.18	49.6	0	0	0	.076
			4.18	14.06	49.0	20.4	20.4	60.9	.082
			4.16	14.00	49.0	20.6	41.0	122.4	4.799
			4.08	13.91	49.6	18.7	59.7	178.3	8.194
			4.11	13.85	49.0	19.6	79.3	236.8	11.197
			4.09	14.15	50.2	19.7	99.0	295.6	14.113
			4.09	13.79	49.0	20.7	119.7	357.4	17.475
			4.14	13.95	49.0	18.6	138.3	413.0	20.717
			4.13	13.89	49.0	20.0	158.3	472.7	24.069
			4.02	13.89	50.2	30.3	188.6	563.2	28.499
			4.05	13.97	50.2	21.1	209.7	626.2	31.126
49A	79.0	0.3349	1.53	40.76	397.6	0	0	0	.039
			1.53	40.85	398.2	50.2	50.2	149.9	1.766
			1.48	39.80	400.1	49.4	99.6	297.4	4.834
			1.52	40.37	396.9	70.1	169.7	506.7	9.107
			1.48	39.81	400.7	100.0	269.7	805.3	11.046
			1.53	40.62	396.9	100.6	370.3	1105.7	12.738
			1.49	39.68	397.6	100.0	470.3	1404.3	21.050
			1.51	40.15	396.9	72.1	542.4	1619.6	25.241
			1.54	41.14	400.1	100.0	642.4	1918.2	26.317
			1.54	40.88	396.3	201.1	843.5	2518.7	39.385
49	61.6	0.3349	1.57	45.31	399.6	0	0	0	.045
			1.47	40.63	400.8	48.7	48.7	145.4	1.747
			1.47	40.30	396.4	54.8	103.5	309.0	4.297
			1.48	40.84	399.6	51.1	154.6	461.6	6.785
			1.49	40.89	396.4	73.8	228.4	682.0	8.592
			1.49	40.92	395.8	99.8	328.2	980.0	13.180
			1.48	41.09	400.8	101.1	429.3	1281.9	19.260
			1.52	41.74	397.1	99.8	529.1	1579.9	13.033
			1.50	41.45	399.6	98.6	627.7	1874.3	21.257
			1.48	40.95	401.5	102.3	730.0	2179.8	26.579
			1.49	40.97	398.3	150.5	880.5	2629.1	23.531
			1.45	39.67	396.4	203.8	1084.3	3257.7	24.105
			1.48	40.74	399.0	500.5	1584.8	4732.2	27.550
			1.33	37.05	402.7	990.3	2575.1	7689.2	52.571
48	81.5	0.3349	2.21	58.91	403.3	0	0	0	.080
			2.21	58.57	398.9	20.8	20.8	62.1	.966
			2.21	57.94	392.6	19.6	40.4	120.6	4.250
			2.22	58.61	395.1	21.5	61.9	184.8	6.653
			2.17	57.57	397.6	19.1	81.0	241.9	8.095
			2.20	57.91	394.5	50.7	131.7	393.3	12.820
			2.21	58.20	397.0	21.6	153.3	457.7	14.515
			2.14	56.80	397.6	49.0	202.3	604.1	19.990
			2.19	57.66	395.8	50.0	252.3	753.4	23.192
			2.23	59.29	397.0	69.8	322.1	961.8	32.700
			2.23	58.71	395.8	50.9	373.0	1113.8	36.609
			2.22	59.15	397.0	49.1	422.1	1260.4	40.590
			2.17	57.49	397.6	50.1	472.2	1410.1	29.430
			2.19	58.16	397.6	41.0	513.2	1532.4	38.289
50A	70.2	0.3349	3.78	102.23	396.3	0	0	0	.154
			3.83	104.02	398.8	21.4	21.4	63.9	3.255
			3.80	102.90	397.6	10.8	32.2	96.1	6.862
			3.77	102.07	397.6	10.5	42.7	127.5	9.063
			3.78	102.73	399.5	21.5	64.2	191.7	13.423
			3.73	101.95	401.4	20.3	84.5	252.3	17.538
			3.78	103.10	401.4	19.1	103.6	309.3	21.890
			3.79	103.12	400.1	19.8	123.4	368.5	16.949
			3.81	103.06	397.6	20.5	143.9	429.7	22.997
			3.79	102.65	398.2	20.1	164.0	489.7	20.254
50	76.1	0.3349	3.88	104.23	399.2	0	0	0	.186
			3.86	103.76	399.9	10.7	10.7	31.9	.795
			3.90	101.96	400.5	21.0	31.7	94.7	8.193
			3.89	104.40	399.2	10.6	42.3	126.3	12.112
			3.85	101.33	401.8	20.7	63.0	188.1	16.942
			3.87	104.25	399.9	20.1	83.1	248.1	21.401
			3.90	105.71	402.4	20.2	103.3	308.5	26.223
			3.89	104.67	399.9	19.4	122.7	366.4	29.268
			3.87	104.24	399.9	30.0	152.7	456.0	34.029
			3.88	104.30	399.2	31.5	184.2	550.0	39.376
			3.88	104.42	399.9	50.9	235.1	702.0	48.834
49B	75.6	0.3349	1.55	41.77	398.8	0	0	0	.063
			1.48	40.02	399.5	11.3	11.3	33.7	.131
			1.48	39.83	398.2	20.2	31.5	94.1	1.575
			1.48	39.41	396.3	50.0	81.5	243.4	4.819
			1.48	39.61	396.9	49.9	131.4	392.4	7.128
			1.49	39.84	396.9	69.9	201.3	601.1	12.047
			1.48	39.72	397.6	60.0	261.3	777.2	13.631
			1.50	40.23	396.9	70.0	331.3	989.3	17.266
			1.52	40.63	397.6	70.6	401.9	1200.1	16.932
			1.49	40.35	402.6	100.5	502.4	1500.1	27.630
			1.51	40.60	399.5	69.9	572.3	1708.9	35.122
			1.51	40.48	399.5	50.1	622.4	1858.4	39.870
			1.52	40.55	398.8	49.7	672.1	2007.8	45.826

TABLE B-25

CONTAMINANT TOLERANCE OF 325 X 2300 TDDW FLOWING GASEOUS HYDROGEN
CONTAMINANT: AC COARSE DUST-IRON PYRITE MIXTURE

Test No.	Avg Temp °F	Screen Area In^2	Avg Flow Rate ACFM/In^2	Avg Flow Rate SCFM/In^2	Inlet Press psia	Add Mg	Cum Add Mg	Cum Add Mg/In^2	Net ΔP psid
52	72.0	0.3349	1.61	5.41	49.0	0	0	0	.090
			1.59	5.14	47.1	8.9	8.9	26.6	.315
			1.59	5.59	50.9	20.8	29.7	88.7	1.446
			1.55	5.48	50.9	20.1	49.8	148.7	2.279
			1.58	5.57	50.9	20.0	69.8	208.4	2.927
			1.61	5.59	50.2	49.0	118.8	354.7	4.848
			1.62	5.55	49.6	49.9	168.7	503.7	5.969
			1.61	5.44	49.0	70.3	239.0	713.6	6.858
			1.60	5.57	50.9	101.0	340.0	1015.2	10.522
			1.62	5.65	50.9	101.0	441.0	1316.8	14.406
			1.58	5.44	50.2	100.0	541.0	1615.4	19.009
			1.57	5.46	50.9	100.2	641.2	1914.6	23.576
			1.59	5.50	50.9	159.6	800.8	2391.1	30.790
			1.60	5.43	50.2	50.2	851.0	2541.1	38.789
51	100.4	0.3349	2.46	8.24	51.8	0	0	0	.278
			2.53	8.21	50.5	10.9	10.9	35.5	1.021
			2.52	7.88	48.6	10.2	21.1	63.0	2.286
			2.52	7.88	48.6	20.3	41.4	123.6	4.046
			2.43	7.92	50.5	20.7	62.1	185.4	5.908
			2.49	8.13	50.5	42.0	104.1	310.8	7.428
			2.46	7.94	49.9	58.7	162.8	486.1	10.221
			2.46	7.73	48.6	100.1	262.9	785.0	16.989
			2.49	7.69	48.0	100.0	362.9	1083.6	22.585
			2.43	7.58	48.6	99.6	462.5	1381.0	29.728
			2.41	7.78	50.5	61.8	524.3	1565.5	40.862
53	76.6	0.3349	4.11	13.37	48.3	0	0	0	.293
			4.04	13.53	49.6	10.4	10.4	31.1	1.583
			4.01	13.25	49.0	10.7	21.1	63.0	4.492
			4.05	13.32	49.0	20.0	41.1	122.7	8.043
			3.99	13.44	50.2	31.0	72.1	215.3	11.515
			4.07	13.37	49.0	50.2	122.3	365.2	18.480
			4.08	13.40	49.0	50.8	173.1	516.9	35.131
55	31.3	0.3349	1.53	40.71	401.9	0	0	0	.095
			1.50	39.99	401.9	9.9	9.9	29.6	.788
			1.53	40.46	397.5	10.4	20.3	60.6	1.973
			1.51	39.91	398.1	20.6	40.9	122.1	3.149
			1.51	39.97	400.0	51.0	91.9	274.4	5.166
			1.52	40.82	400.6	100.7	192.6	575.1	11.843
			1.49	39.78	398.1	100.4	293.0	874.9	19.038
			1.50	39.77	397.5	99.6	392.6	1172.3	27.903
			1.50	39.92	398.7	70.8	463.4	1383.7	32.176
			1.49	39.62	397.5	70.9	534.3	1595.4	33.250
			1.49	39.73	39[illegible].1	100.0	634.3	1894.0	37.519
			1.49	39.79	39[illegible].7	149.2	783.5	2339.5	46.453
54D	67.8	0.3349	2.18	60.14	402.0	0	0	0	.170
			2.20	60.48	401.4	11.1	11.1	33.1	1.004
			2.19	60.22	401.4	10.0	21.1	63.0	2.291
			2.21	60.19	397.6	10.4	31.5	94.1	3.232
			2.19	59.72	398.8	20.0	51.5	153.8	4.662
			2.18	59.59	400.1	21.3	72.8	217.4	6.026
			2.20	60.07	400.1	50.9	123.7	369.4	9.113
			2.19	59.35	396.9	49.6	173.3	517.5	13.591
			2.22	60.84	400.7	49.4	222.7	665.0	19.419
			2.22	60.67	399.5	50.7	273.4	816.4	25.436
			2.17	59.57	401.4	51.6	325.0	970.4	28.954
			2.22	60.48	398.2	70.2	295.2	1180.1	33.686
			2.23	60.69	298.2	71.1	466.3	1392.4	38.657
			2.20	60.33	400.1	101.0	567.3	1693.9	48.284
56A	63.9	0.3349							.362
			3.79	104.40	400.1	0	0	0	
			3.77	104.48	401.4	10.2	10.2	30.5	2.859
			3.80	105.25	401.4	9.9	20.1	60.0	7.556
			3.75	104.71	400.7	10.1	30.2	90.2	10.235
			3.79	104.42	400.1	9.9	40.1	119.7	12.209
			3.78	104.53	401.4	20.4	60.5	180.7	17.514
			3.80	104.78	400.1	20.7	81.2	242.5	22.204
			3.78	103.98	399.5	21.0	102.2	305.2	27.081
			3.79	104.02	398.8	21.0	123.2	367.9	31.234
			3.80	104.23	398.2	20.3	143.5	428.5	36.825
			3.78	103.59	398.8	20.4	163.9	489.4	40.992
			3.78	103.69	398.8	19.0	182.9	546.1	46.284
56	69.7	0.3349	3.92	107.05	400.5	0	0	0	.594
			3.89	105.11	397.3	11.5	11.5	34.3	2.709
			3.84	101.62	398.0	10.3	21.8	65.1	6.471
			3.92	105.85	399.2	9.9	31.7	94.7	4.857
			3.87	102.78	397.3	9.5	41.2	123.0	12.001
			3.89	105.36	401.8	10.7	51.9	155.0	14.164
			3.88	104.66	399.2	19.4	71.3	212.9	19.076
			3.89	104.86	399.2	21.1	92.4	275.9	21.681
			3.90	105.14	398.6	20.1	112.5	335.9	26.721
			3.89	104.89	399.2	51.1	163.6	488.5	36.972
			3.88	104.74	399.2	19.5	183.1	546.7	40.070
			3.90	105.30	399.9	20.9	204.0	609.1	47.368

TABLE B26

CONTAMINANT TOLERANCE OF 325 x 2300 TDDW

WITH PPO (POLYPHENOLENE OXIDE) AND WATER

Temperature: 78°F

Flow Rate: Noted

Flow Rate gpm	Flow Rate gpm/in^2	Add Size, mg	Accum Add, mg	Accum Add, mg/in^2	Net ΔP PSI
10.4	6.56	0	0	0	13.1
		30	30	18.9	16.6
		30	60	37.9	22.6
		30	90	56.8	26.1
		30	120	75.8	33.6
		15	135	85.2	37.6
		15	150	94.7	42.6
		15	165	104.2	48.1
3.5	2.2	0	0	0	3.2
		6	6	3.79	3.5
		6	12	7.58	3.6
		6	18	11.4	3.7
		6	24	15.2	4.1
		6	30	18.9	4.4
		30	60	37.9	4.9
		30	90	56.8	5.7
		30	120	75.8	6.8
		30	150	94.7	7.8
		30	180	113.6	9.0
		30	210	132.6	11.0
		30	240	151.5	12.0
		60	300	189.4	13.0
		60	360	227.3	15.0
		60	420	265.2	15.0
		120	540	340.9	17.0
		120	660	416.7	18.5
		120	780	492.4	34.0
		60	840	530.3	38.0
		60	900	568.2	43.5
		60	960	606.1	49.5

TABLE B-27

CONTAMINANT TOLERANCE OF 325 x 2300 TWILLED DUTCH DOUBLE WEAVE WIRE CLOTH

Fluid: Deionized Water

Temperature: 70°F

Contaminant: WSTF Dust (310-FTP)

Time Interval: 2 Minutes Between Adds

Flow: 3.5 gpm

Flow/Unit Area: 2.2 gpm/in^2

System Tare: 0.83 psid

Screen Area: 1.584 in^2

Add Size mg.	Accum Add mg.	Accum Add mg/in^2	Net ΔP psid
0	0	0	3.77
2.5	2.5	1.6	3.97
2.5	5.0	3.2	4.02
2.5	7.5	4.7	4.07
2.5	10.0	6.3	4.17
2.5	12.5	7.9	4.27
2.5	15.0	9.5	4.32
2.5	17.5	11.0	4.37
2.5	20.0	12.6	4.47
2.5	22.5	14.2	4.52
2.5	25.0	15.8	4.57
2.5	27.5	17.4	4.62
5.0	32.5	20.5	4.87
5.0	37.5	23.7	5.02

Add Size mg.	Accum Add mg.	Accum Add mg/in^2	Net ΔP psid
10.0	47.5	30.0	5.37
10.0	57.5	36.3	5.77
10.0	67.5	42.6	6.37
20.0	87.5	55.2	7.07
20.0	107.5	67.9	8.27
20.0	127.5	80.5	9.17
30.0	157.5	99.4	11.17
30.0	187.5	118.4	14.67
50.0	237.5	149.9	19.67
50.0	287.5	181.5	26.37
50.0	337.5	213.1	34.67
50.0	387.5	244.6	43.67
50.0	437.5	276.2	54.17

TABLE B-28

FLOW RESISTANCE OF TWILLED DUTCH DOUBLE WEAVE WIRE CLOTH - FLUID: DEIONIZED WATER

	ENGLISH UNITS								METRIC UNITS							
				Sample 1		Sample 2						Sample 1		Sample 2		
Grade Of Wire Cloth	Flow gpm	gpm/in²	Tare ΔP psid	Net ΔP psid	Temp °F	Net ΔP psid	Temp °F	Avg. ΔP psid	Flow liters/min	liters/min cm²	Tare ΔP kg/cm²	Net ΔP kg/cm²	Temp °C	Net ΔP kg/cm²	Temp °C	Avg. ΔP kg/cm²
450 x 2750	2.0	1.26	0.34	2.21	77	2.26	77	2.24	7.57	0.74	0.024	0.155	25	0.159	25	0.157
	3.0	1.89	0.70	3.50	77	3.60	77	3.55	11.4	1.11	0.049	0.246	25	0.253	25	0.250
	4.0	2.53	1.18	5.32	77	5.12	77	5.22	15.1	1.48	0.083	0.374	25	0.360	25	0.367
	5.0	3.16	1.80	7.00	77	6.90	77	6.95	18.9	1.85	0.127	0.492	25	0.485	25	0.489
	6.0	3.79	2.53	9.50	77	8.50	77	9.00	22.7	2.22	0.178	0.668	25	0.598	25	0.633
200 x 1400	2.0	1.26	0.05	0.87	76			0.87	7.57	0.74	0.004	0.061	24.4			0.061
	3.0	1.89	0.10	1.60	76			1.60	11.4	1.11	0.007	0.112	24.4			0.112
	4.0	2.53	0.17	2.32	76			2.32	15.1	1.48	0.012	0.163	24.4			0.163
	5.5	3.47	0.30	3.65	76			3.65	20.8	2.04	0.021	0.257	24.4			0.257
	7.0	4.42	0.47	5.29	76			5.29	26.5	2.59	0.033	0.372	24.4			0.372
	9.0	5.68	0.75	7.25	76			7.25	34.1	3.33	0.053	0.510	24.4			0.510
	11.0	6.94	1.10	9.77	76			9.77	41.6	4.07	0.077	0.687	24.4			0.687
325 x 2300	0.215	0.14	--	0.19	73	0.19	74	0.19	0.81	0.08	--	0.013	22.8	0.013	23.9	0.013
	0.457	0.29	.016	0.38		0.40		0.39	1.73	0.17	0.001	0.027		0.028		0.028
	1.735	1.10	.182	1.67		1.67		1.67	6.57	0.65	0.013	0.117		0.117		0.117
	3.5	2.21	0.65	3.75	73	3.85	74	3.80	13.2	1.30	0.046	0.264	22.8	0.271	23.9	0.268
	5.3	3.35	1.4	6.6		6.7		6.65	20.1	1.97	0.098	0.464		0.471		0.469
	9.53	6.02	4.1	14.9		14.8		14.85	36.1	3.53	0.288	1.05		1.04		1.05
	10.5	6.63	4.8	17.0	74	17.2	74	17.1	39.7	3.89	0.337	1.20	23.9	1.21	23.9	1.21
165 x 1400	0.215	0.14	--	0.08	74.5	0.09	74	0.09	0.81	0.08	--	0.006	23.6	0.006	23.3	0.006
	0.457	0.29	0.016	0.13		0.16		0.15	1.73	0.17	0.001	0.009		0.011		0.010
	1.735	1.10	0.182	0.63	74.5	0.58	74.5	0.61	6.57	0.65	0.013	0.044	23.6	0.041		0.043
	3.5	2.21	0.65	1.49		1.45		1.47	13.2	1.30	0.046	0.105		0.102	23.6	0.104
	5.3	3.35	1.4	2.6	74	2.6	74.5	2.6	20.1	1.97	0.098	0.183		0.183		0.183
	9.53	6.02	4.1	6.1		6.0		6.1	36.1	3.53	0.289	0.429	23.3	0.422	23.6	0.426
80 x 700	2.5	1.58	0.35	0.61	82	0.68	82	0.65	9.5	0.93	0.025	0.043	27.8	0.048	27.8	0.046
	3.5	2.21	0.67	1.06	82	1.13	82	1.10	13.2	1.30	0.047	0.075	27.8	0.079	27.8	0.077
	6.0	3.79	1.83	2.72	82	2.77	82	2.75	22.7	2.22	0.129	0.191	27.8	0.195	27.8	0.193
	8.0	5.05	3.15	4.80	82	4.85	82	4.83	30.3	2.96	0.221	0.337	27.8	0.341	27.8	0.340
	10.4	6.57	5.35	7.65	82	7.65	82	7.65	39.4	3.85	0.376	0.538	27.8	0.538	27.8	0.538
	11.0	6.94	5.95	9.05	82	8.05	82	8.55	41.6	4.07	0.418	0.636	27.8	0.566	27.8	0.601
30 x 250	0.215	0.14	--	.010	75	.020	72	.015	0.81	0.08	--	0.001	23.9	0.001	22.2	0.001
	0.457	0.29	.016	.024		.034		.029	1.73	0.17	0.001	0.002		0.002		0.002
	1.735	1.10	.182	0.25		0.25		0.25	6.57	0.65	0.013	0.018		0.018		0.018
	3.5	2.21	0.65	.90	75	0.95	72	0.93	13.2	1.30	0.046	0.063	23.9	0.067	22.2	0.065
	5.3	3.35	1.4	1.9		2.0		1.95	20.1	1.97	0.098	0.13[illegible]		0.141		0.138
	9.53	6.02	4.1	6.4	76	5.9	73	6.2	36.1	3.53	0.288	0.450	24.4	0.415	22.8	0.433
30 x 370	2.5	1.58	0.35	0.31	80	0.31	79	0.31	9.46	0.93	0.025	0.022	26.7	0.022	26.1	0.022
	3.5	2.21	0.67	0.53	75	0.53	79	0.53	13.2	1.30	0.047	0.037	26.1	0.037	26.1	0.037
	6.0	3.79	1.83	1.42	79	1.42	79	1.42	22.7	2.22	0.129	0.100	26.1	0.100	26.1	0.100
	8.0	5.05	3.15	2.55	79	2.50	79	2.53	30.3	2.96	0.221	0.17[illegible]	25.1	0.176	25.1	0.178
	10.4	6.57	5.35	4.05	79	4.00	79	4.03	39.4	3.85	0.376	0.285	26.1	0.281	26.1	0.283
40 x 550	2.5	1.58	0.35	0.32	79	0.31	79	0.32	9.46	0.93	0.025	0.022	26.1	0.022	26.1	0.022
	3.5	2.21	0.67	0.53	79	0.55	79	0.54	13.2	1.30	0.047	0.037	26.1	0.039	26.1	0.038
	6.0	3.79	1.83	1.37	79	1.32	79	1.35	22.7	2.22	0.129	0.096	26.1	0.093	26.1	0.095
	8.0	5.05	3.15	2.40	79	2.35	79	2.38	30.3	2.96	0.221	0.169	26.1	0.165	26.1	0.167
	10.4	6.57	5.35	3.85	79	3.75	79	3.80	39.4	3.85	0.376	0.271	26.1	0.264	26.1	0.267

Table B-29

FLOW RESISTANCE OF PLAIN DUTCH SINGLE WEAVE WIRE CLOTH

Fluid: Deionized Water

Grade of Wire Cloth	ENGLISH UNITS: Flow Rate gpm	ENGLISH UNITS: Flow Rate gpm/in²	Tare ΔP psid	Net ΔP psid	Temp °F	METRIC UNITS: Flow Rate l/min	Flow Rate l/min cm²	Tare ΔP kg/cm²	Net ΔP kg/cm²	Temp °C
30 x 150	2.0	1.26	0.045	0.075	65	7.57	0.74	0.003	0.005	18.3
	3.0	1.89	0.09	0.16		11.4	1.11	0.006	0.011	
	4.0	2.53	0.16	0.21		15.1	1.48	0.011	0.015	
	5.5	3.47	0.29	0.38		20.8	2.04	0.020	0.027	
	7.0	4.42	0.44	0.57		26.5	2.59	0.031	0.040	
	9.0	5.68	0.70	0.89		34.1	3.33	0.049	0.063	
	11.0	6.94	1.00	1.26		41.6	4.07	0.070	0.089	
30 x 160	1.02	0.64	.01	.038	68	3.86	0.38	0.0007	0.003	20.0
	1.51	0.95	.02	.058		5.72	0.56	0.0014	0.004	
	2.0	1.26	.03	.085		7.57	0.74	0.0021	0.006	
	3.0	1.91	.06	.165		11.36	1.11	0.0042	0.012	
	4.0	2.52	.09	.26		15.14	1.48	0.0063	0.018	
	5.0	3.14	.14	.34		18.93	1.85	0.010	0.024	
	6.0	3.78	.18	.48		22.71	2.22	0.013	0.034	
	7.0	4.40	.24	.63		26.50	2.59	0.017	0.044	
	8.0	5.04	.30	.75		30.28	2.96	0.021	0.053	
	9.0	5.69	.37	.95		34.07	3.33	0.026	0.067	
	10.0	6.30	.45	1.10		37.85	3.70	0.032	0.077	
	11.0	6.95	.53	1.33		41.64	4.07	0.037	0.093	
80 x 400	2.0	1.26	0.045	0.135	65	7.57	0.74	0.003	0.009	18.3
	3.0	1.89	0.0[illegible]	0.25		11.4	1.11	0.006	0.018	
	4.0	2.53	0.16	0.37		15.1	1.48	0.011	0.026	
	5.5	3.47	0.29	0.58		20.8	2.04	0.020	0.041	
	7.0	4.42	0.44	0.87		26.5	2.59	0.031	0.061	
	9.0	5.68	0.70	1.29		34.1	3.33	0.049	0.091	
	11.0	6.94	1.00	1.79		41.6	4.07	0.070	0.126	
165 x 800	2.0	1.26	0.045	0.215	66	7.57	0.74	0.003	0.015	18.9
	3.0	1.89	0.09	0.37		11.4	1.11	0.006	0.026	
	4.0	2.53	0.16	0.50		15.1	1.48	0.011	0.035	
	5.5	3.47	0.29	0.80		20.8	2.04	0.020	0.056	
	7.0	4.42	0.44	1.14		26.5	2.59	0.031	0.080	
	9.0	5.68	0.70	1.67		34.1	3.33	0.049	0.117	
	11.0	6.94	1.00	2.24		41.6	4.07	0.070	0.157	
180 x 900	2.0	1.26	0.045	0.215	68	7.57	0.74	0.003	0.014	20.0
	3.0	1.89	0.09	0.34		11.4	1.11	0.006	0.024	
	4.0	2.53	0.16	0.47		15.1	1.48	0.011	0.033	
	5.5	3.47	0.29	0.76		20.8	2.04	0.020	0.053	
	7.0	4.42	0.44	1.06		26.5	2.59	0.031	0.075	
	9.0	5.6[illegible]	0.70	1.56		34.1	3.33	0.049	0.110	
	11.0	6.94	1.00	2.08		41.6	4.07	0.070	0.146	
Double Warp 2x120x650	1.02	0.64	0.01	0.095	68	3.86	0.38	0.0007	0.007	20.0
	1.51	0.95	0.02	0.16		5.72	0.56	0.0014	0.011	
	2.0	1.26	0.03	0.23		7.57	0.74	0.0021	0.016	
	3.0	1.91	0.06	0.42		11.36	1.11	0.0042	0.029	
	4.0	2.52	[illegible]	0.62		15.14	1.48	0.0063	0.043	
	5.0	3.14	0.14	0.86		18.93	1.85	0.010	0.060	
	6.0	3.78	0.18	1.19		22.71	2.22	0.013	0.083	
	7.0	4.40	0.24	1.49		26.50	2.59	0.017	0.104	
	8.0	5.04	0.30	1.85		30.28	2.96	0.021	0.130	
	9.0	5.69	0.37	2.23		34.07	3.33	0.026	0.156	
	10.0	6.30	0.45	2.60		37.85	3.70	0.032	0.192	
	11.0	6.95	0.53	3.07		41.64	4.07	0.037	0.215	
Double Warp 2 X 150 X 300	1.02	0.64	0.01	0.13	71	3.86	0.38	0.0007	0.009	21.7
	1.51	0.95	0.02	0.19		5.72	0.56	0.0014	0.013	
	2.0	1.26	0.03	0.26		7.57	0.74	0.0021	0.018	
	3.0	1.91	0.06	0.44		11.36	1.11	0.0042	0.031	
	4.0	2.52	0.09	0.66		15.14	1.48	0.0063	[illegible]	
	5.0	3.14	0.14	0.92		18.93	1.85	0.010	[illegible]	
	6.0	3.78	0.18	1.23		22.71	2.22	0.013	[illegible]	
	7.0	4.40	0.24	1.54		[illegible]	[illegible]	[illegible]	[illegible]	
	8.0	[illegible]	0.30	1.92		[illegible]	[illegible]	[illegible]	[illegible]	
	9.0	[illegible]	0.37	2.33		[illegible]	[illegible]	[illegible]	0.164	
	10.0	6.30	0.45	[illegible]		[illegible]	[illegible]	[illegible]	0.193	
	11.0	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	

TABLE B-30

FLOW RESISTANCE OF 120 x 600 HAVER & BOECKER BROAD MESH TWILLED WEAVE WIRE CLOTH

FLUID: DEIONIZED WATER

Grade	ENGLISH UNITS					METRIC UNITS				
	Flow gpm	gpm/ in^2	Tare ΔP psid	Net ΔP psid	Temp °F	Flow liters /min	liters /min cm^2	Tare ΔP kg/cm	Net ΔP kg/cm	Temp °C
BMT 30, 120 x 600	1.0	0.63	0.06	0.07	77	3.79	0.37	0.004	0.005	25.0
	2.0	1.26	0.22	0.12	77	7.57	0.74	0.015	0.008	25.0
	3.0	1.89	0.48	0.22	76	11.4	1.11	0.034	0.015	24.4
	4.0	2.53	0.84	0.31	76	15.1	1.48	0.059	0.022	24.4
	5.0	3.16	1.30	0.45	76	18.9	1.85	0.091	0.032	24.4
	6.0	3.79	1.82	0.66	76	22.7	2.22	0.128	0.046	24.4

TABLE B-31

FLOW RESISTANCE OF TWILLED SQUARE WEAVE WIRE CLOTH

Fluid: Deionized Water

	ENGLISH UNITS					METRIC UNITS				
	Flow Rate		Tare	Net		Flow Rate		Tare	Net	
Grade Of Wire Cloth	gpm	gpm/in²	ΔP, psid	ΔP, psid	Temp °F	l/min	l/min cm²	ΔP kg/cm²	ΔP kg/cm²	Temp °C
	2.0	1.26	0.04	0.07		7.57	0.59	0.003	0.005	
	3.0	1.89	0.086	0.134		11.4	0.74	0.006	0.009	
400 x 400	4.0	2.53	0.15	0.17	73	15.1	1.11	0.011	0.012	22.8
	5.5	3.47	0.27	0.28		20.8	1.48	0.019	0.020	
	7.0	4.42	0.43	0.42		26.5	2.04	0.030	0.030	
	9.0	5.68	0.70	0.62		34.1	2.59	0.049	0.044	
	11.0	6.94	1.00	0.87		41.6	3.33	0.070	0.061	
	2.0	1.26	0.045	0.085		7.57	0.59	0.003	0.006	
	3.0	1.89	0.094	0.146		11.4	0.74	0.006	0.010	
	4.0	2.53	0.160	0.200		15.1	1.11	0.011	0.014	
508 x 508	5.5	3.47	0.285	0.345	70	20.8	1.48	0.020	0.024	21.1
	7.0	4.42	0.44	0.51		26.5	2.04	0.031	0.036	
	9.0	5.68	0.70	0.77		34.1	2.59	0.049	0.054	
	11.0	6.94	1.00	1.06		41.6	3.33	0.070	0.074	
	2.0	1.26	0.045	0.105		7.57	0.59	0.003	0.007	
	3.0	1.89	0.094	0.136		11.4	0.74	0.006	0.010	
	4.0	2.53	0.160	0.230		15.1	1.11	0.011	0.016	
635 x 635	5.5	3.47	0.285	0.385	70	20.8	1.48	0.020	0.027	21.1
	7.0	4.42	0.44	0.56		26.5	2.04	0.031	0.039	
	9.0	5.68	0.70	0.83		34.1	2.59	0.049	0.058	
	11.0	6.94	1.00	1.13		41.6	3.33	0.070	0.079	
	2.0	1.26	0.045	0.115		7.57	0.59	0.003	0.008	
	3.0	1.89	0.094	0.186		11.4	0.74	0.006	0.013	
850 x 850	4.0	2.53	0.160	0.260	65	15.1	1.11	0.011	0.018	18.3
	5.5	3.47	0.285	0.425		20.8	1.48	0.020	0.030	
	7.0	4.42	0.44	0.59		26.5	2.04	0.031	0.041	
	9.0	5.68	0.70	0.85		34.1	2.59	0.049	0.060	
	11.0	6.94	1.00	1.15		41.6	3.33	0.070	0.081	

TABLE B-32

FLOW RESISTANCE OF PLAIN SQUARE WEAVE WIRE CLOTH

Fluid: Deionized Water

Grade Of Cloth	Flow Rate gpm	Flow Rate gpm/in²	Temp °F	Tare ΔP psid	Net ΔP psid
18 x 18	3.17	2.00	72	0.07	0.02
	4.03	2.54		0.12	0.04
	5.01	3.16		0.17	0.06
	6.03	3.81		0.23	0.10
	7.01	4.43		0.31	0.13
	8.03	5.07		0.39	0.18
	9.00	5.68		0.49	0.20
	10.02	6.33		0.58	0.26
	11.00	6.94		0.69	0.31
	11.22	7.08		0.72	0.32
24 x 24	3.17	2.00	72	0.07	0.02
	4.03	2.54		0.12	0.03
	5.01	3.16		0.17	0.04
	6.03	3.81		0.23	0.07
	7.01	4.43		0.31	0.09
	8.03	5.07		0.39	0.14
	9.00	5.68		0.49	0.15
	10.02	6.33		0.58	0.21
	11.00	6.94		0.69	0.24
50 x 50	3.17	2.00	72	0.07	0.01
	4.03	2.54		0.12	0.04
	5.01	3.16		0.17	0.09
	6.03	3.81		0.23	0.13
	7.01	4.43		0.31	0.17
	8.03	5.07		0.39	0.25
	9.00	5.68		0.49	0.29
	10.02	6.33		0.58	0.40
	11.00	6.94		0.69	0.47
60 x 60	3.17	2.00	72	0.07	0.05
	4.03	2.54		0.12	0.06
	5.01	3.16		0.17	0.11
	6.03	3.81		0.23	0.16
	7.01	4.43		0.31	0.22
	8.03	5.07		0.39	0.27
	9.00	5.68		0.49	0.35
	10.02	6.33		0.58	0.43
	11.00	6.94		0.69	0.52
80 x 80	3.17	2.00	72	0.07	0.04
	4.03	2.54		0.12	0.08
	5.01	3.16		0.17	0.11
	6.03	3.81		0.23	0.17
	7.01	4.43		0.31	0.21
	8.03	5.07		0.39	0.30
	9.00	5.68		0.49	0.35
	10.02	6.33		0.58	0.43
	11.00	6.94		0.69	0.52
100 x 100	2.0	1.26	71	0.045	0.025
	3.0	1.89		0.094	0.066
	4.0	2.53		0.160	0.100
	5.5	3.47		0.285	0.175
	7.0	4.42		0.44	0.28
	9.0	5.68		0.70	0.43
	11.0	6.94		1.00	0.63
150 x 150	2.0	1.26	70	0.045	0.035
	3.0	1.89		0.094	0.076
	4.0	2.53		0.160	0.110
	5.5	3.47		0.285	0.215
	7.0	4.42		0.44	0.31
	9.0	5.68		0.70	0.51
	11.0	6.94		1.00	0.72
200 x 200	2.0	1.26	70	0.045	0.035
	3.0	1.89		0.094	0.076
	4.0	2.53		0.160	0.12
	5.5	3.47		0.285	0.285
	7.0	4.42		0.44	0.33
	9.0	5.68		0.70	0.52
	11.0	6.94		1.00	0.79
250 x 250	2.0	1.26	70	0.045	0.035
	3.0	1.89		0.094	0.086
	4.0	2.53		0.160	0.14
	5.5	3.47		0.285	0.255
	7.0	4.42		0.44	0.36
	9.0	5.68		0.70	0.58
	11.0	6.94		1.00	0.84

TABLE B-33

FLOW RESISTANCE OF SYNTHETIC MONOFILAMENT WOVEN CLOTH - FLUID: DEIONIZED WATER

Grade of Synthetic Cloth	ENGLISH UNITS									METRIC UNITS								
	Flow gpm	gpm/ in^2	Tare ΔP psid	SAMPLE NUMBER 1 Net ΔP psid	SAMPLE NUMBER 1 Temp °F	SAMPLE NUMBER 2 Net ΔP psid	SAMPLE NUMBER 2 Temp °F	AVG. ΔP psid	AVG. Temp. °F	Liters /min.	Liters /min. cm^2	Tare ΔP Kg/cm^2	SAMPLE NUMBER 1 Net ΔP Kg/cm^2	SAMPLE NUMBER 1 Temp °C	SAMPLE NUMBER 2 Net ΔP Kg/cm^2	SAMPLE NUMBER 2 Temp °C	AVG. ΔP Kg/cm^2	AVG. Temp °C
	.215	.136	--	--	75	-	75	--	75	.514	.08	--	--	23.9	--	23.9	--	23.9
ASTM	.457	.289	.016	--		--		--		1.73	.17	.001	--		--		--	
100-149	1.735	1.10	.182	.02		.03		.025		6.57	.65	.013	.001		.002		.002	
	3.5	2.21	.65	.11	75	.09	75	.10	75	13.2	1.30	.046	.008	23.9	.006	23.9	.007	23.9
Nylon	5.3	3.35	1.4	.30		.30		.30		20.1	1.97	.098	.021		.021		.021	
	9.53	6.02	4.1	1.2		1.1		1.15		36.1	3.53	.288	.084		.077		.081	
	10.5	6.63	4.8	1.6	76	1.6	76	1.6	76	39.7	3.89	.337	.112	24.4	.112	24.4	.112	24.4
	.215	.136	.003	.003	77	.005	77.5	.004	77.3	.514	.08	--	--	25.0	--	25.3	--	25.2
PE-7	.457	.289	.016	.007		.007		.007		1.73	.17	.001	--		--		--	
-104-105	1.735	1.10	.160	.030		.025		.028		6.57	.65	.011	.002		.002		.002	
	3.5	2.21	.585	.105	77.5	.090	77.5	.098	77.5	13.2	1.30	.041	.007	25.3	.006	25.3	.007	25.3
Polyester	5.3	3.35	1.29	.21		.24		.225		20.1	1.97	.091	.015		.017		.016	
	9.53	6.02	4.0	.82		.85		.83		36.1	3.53	.281	.058		.060		.059	
(143 x 143)	10.5	6.63	4.85	1.05	79	1.00	79	1.03	79	39.7	3.89	.341	.074	26.1	.070	26.1	.072	26.1
ASTM	.215	.136	.003	.008	77.5	.007	77.0	.0075	77.3	.514	.08	--	.001	25.3	--	25.0	.001	25.2
200-74	.457	.289	.016	.007		.007		.007		1.73	.17	.001	--		--		--	
Nylon	1.735	1.10	.160	.040		.035		.038		6.57	.65	.011	.003		.002		.003	
(210 x 210)	3.5	2.21	.585	.110		.105		.108		13.2	1.30	.041	.008		.007		.008	
	5.3	3.35	1.29	.260	77.5	.270	77.5	.265	77.5	20.1	1.97	.091	.010	25.3	.019	25.3	.019	25.3
	9.53	6.02	4.0	.95		.90		.925		36.1	3.53	.281	.067		.063		.065	
	10.5	6.63	4.85	1.05	79	1.10	78	1.08	78.5	39.7	3.89	.341	.074	26.1	.077	25.6	.076	25.9
PE-7	.215	.136	.003	.004	77	.004	77	.004	77	.514	.08	--	--	25.0	--	25.0	--	25.0
	.457	.289	.016	.009		.007		.008		1.73	.17	.001	.001		--		.001	
-230-62	1.735	1.10	.160	.035		.030		.033		6.57	.65	.011	.002		.002		.002	
	3.5	2.21	.585	.115	77.5	.108	78	.112	77.8	13.2	1.30	.041	.008		.008		.008	
Polyester	5.3	3.35	1.29	.240		.240		.240		20.1	1.97	.091	.017	25.6	.017	25.6	.017	25.5
	9.53	6.02	4.0	.90		.85		.875		36.1	3.53	.281	.063		.062		.063	
(249 x 249)	10.5	6.63	4.85	1.10	79.5	1.10	79.5	1.10	79.5	39.7	3.89	.341	.077	26.4	.077	26.4	.077	26.4

TABLE B-34

FLOW RESISTANCE OF FIBER FELT - FLUID: DEIONIZED WATER

DYNALLOY - X

	ENGLISH UNITS					METRIC UNITS				
Fiber Felt	Flow gpm	gpm/in²	Tare ΔP psid	Net ΔP psid	Temp. °F	Flow liter /min.	Liter /min. cm²	Tare ΔP kg/cm²	Net ΔP kg/cm²	Temp. °C
Dynalloy X-3	1.0	0.64	0.01	4.7	68	3.8	0.37	0.001	0.174	20.0
	2.0	1.26	0.03	12.8		7.6	0.74	0.002	0.475	
	3.0	1.91	0.06	19.5		11.4	1.11	0.004	0.724	
	4.0	2.52	0.09	26.2		15.1	1.48	0.006	0.972	
	5.0	3.14	0.14	33.4		18.9	1.85	0.010	1.24	
	6.0	3.78	0.18	41.3		22.7	2.22	0.013	1.53	
	7.0	4.40	0.24	48.3		26.5	2.59	0.017	1.79	
	8.0	5.04	0.30	57.7		30.3	2.96	0.021	2.14	
Dynalloy X-4	1.0	0.64	0.01	2.2	68	3.8	0.37	0.001	0.082	20.0
	2.0	1.26	0.03	5.2		7.6	0.74	0.002	0.193	
	3.0	1.91	0.06	8.0		11.4	1.11	0.004	0.297	
	4.0	2.52	0.09	10.7		15.1	1.48	0.006	0.397	
	5.0	3.14	0.14	13.7		18.9	1.85	0.010	0.508	
	6.0	3.78	0.18	17.0		22.7	2.22	0.013	0.631	
	7.0	4.40	0.24	20.2		26.5	2.59	0.017	0.750	
	8.0	5.04	0.30	23.5		30.3	2.96	0.021	0.872	
	9.0	5.69	0.37	26.8		34.1	3.33	0.026	0.995	
	10.0	6.30	0.45	30.9		37.9	3.70	0.032	1.15	
	11.0	6.95	0.53	34.5		41.6	4.07	0.037	1.28	
Dynalloy X-5	1.0	0.64	0.01	1.3	68	3.8	0.37	0.001	0.048	20.0
	2.0	1.26	0.03	2.6		7.6	0.74	0.002	0.097	
	3.0	1.91	0.06	4.0		11.4	1.11	0.004	0.149	
	4.0	2.52	0.09	5.6		15.1	1.48	0.006	0.228	
	5.0	3.14	0.14	7.4		18.9	1.85	0.010	0.275	
	6.0	3.78	0.18	9.1		22.7	2.22	0.013	0.338	
	7.0	4.40	0.24	11.1		26.5	2.59	0.017	0.412	
	8.0	5.04	0.30	13.2		30.3	2.96	0.021	0.490	
	9.0	5.69	0.37	15.1		34.1	3.33	0.026	0.560	
	10.0	6.30	0.45	17.1		37.9	3.70	0.032	0.635	
	11.0	6.95	0.53	19.2		41.6	4.07	0.037	0.713	
Dynalloy X-7	1.0	0.64	0.01	0.1	68	3.8	0.37	0.001	0.004	20.0
	2.0	1.26	0.03	0.5		7.6	0.74	0.002	0.019	
	3.0	1.91	0.06	0.9		11.4	1.11	0.004	0.033	
	4.0	2.52	0.09	1.2		15.1	1.48	0.006	0.045	
	5.0	3.14	0.14	1.6		18.9	1.85	0.010	0.059	
	6.0	3.78	0.18	2.1		22.7	2.22	0.013	0.078	
	7.0	4.40	0.24	2.5		26.5	2.59	0.017	0.093	
	8.0	5.04	0.30	3.1		30.3	2.96	0.021	0.115	
	9.0	5.69	0.37	3.6		34.1	3.33	0.026	0.134	
	10.0	6.30	0.45	4.2		37.9	3.70	0.032	0.156	
	11.0	6.95	0.53	4.9		41.6	4.07	0.037	0.182	
Dynalloy X-11	1.0	0.64	0.01	0.08	68	3.8	0.37	0.001	0.003	20.0
	2.0	1.26	0.03	0.3		7.6	0.74	0.002	0.011	
	3.0	1.91	0.06	0.6		11.4	1.11	0.004	0.222	
	4.0	2.52	0.09	0.8		15.1	1.48	0.006	0.030	
	5.0	3.14	0.14	1.1		18.9	1.85	0.010	0.041	
	6.0	3.78	0.18	1.5		22.7	2.22	0.013	0.056	
	7.0	4.40	0.24	1.8		26.5	2.59	0.017	0.067	
	8.0	5.04	0.30	2.3		30.3	2.95	0.021	0.085	
	9.0	5.69	0.37	2.7		34.1	3.33	0.026	0.100	
	10.0	6.30	0.45	3.2		37.9	3.70	0.032	0.119	
	11.0	6.95	0.53	3.7		41.6	4.07	0.037	0.137	
Dynalloy X-13	1.0	0.64	0.01	0.07	67	3.8	0.37	0.001	0.003	19.5
	2.0	1.26	0.03	0.2		7.6	0.74	0.002	0.007	
	3.0	1.91	0.06	0.3		11.4	1.11	0.004	0.011	
	4.0	2.52	0.09	0.4		15.1	1.48	0.006	0.015	
	5.0	3.14	0.14	0.6		18.9	1.35	0.010	0.022	
	6.0	3.78	0.18	0.8		22.7	2.22	0.013	0.030	
	7.0	4.40	0.24	1.1		26.5	2.59	0.017	0.041	
	8.0	5.04	0.30	1.3		30.3	2.96	0.021	0.048	
	9.0	5.69	0.37	1.7		34.1	3.33	0.026	0.063	
	10.0	6.30	0.45	2.0		37.9	3.70	0.032	0.074	
	11.0	6.95	0.53	2.3		41.6	4.07	0.037	0.085	

TABLE B-35

FLOW RESISTANCE OF POWDERED METAL FILTERS

Fluid: Deionized Water

Mott Filter Grade	Flow gpm	gpm / in^2	Tare ΔP, psid	Net ΔP, psid	Temp °F	Flow liters / min	liters /min/ cm^2	Tare ΔP kg/cm^2	Net ΔP, kg/cm^2	Temp °C
M02	1.0	0.63	0.06	7.9	79	3.79	0.37	.004	0.56	26.1
	2.5	1.58	0.35	20.7	79	9.46	0.93	.025	1.46	26.1
	3.5	2.21	0.65	30.9	79	13.2	1.30	.046	2.17	26.1
	6.0	3.79	1.80	68.7	79	22.7	2.22	.127	4.83	26.1
	8.0	5.05	3.10	96.9	79	30.3	2.96	.218	6.81	26.1
	8.92	5.63	3.80	111.2	79	33.8	3.30	.267	7.82	26.1
M05	1.0	0.63	0.06	6.6	79	3.79	0.37	.004	0.46	26.1
	1.24	0.78	0.09	8.3	79	4.69	0.46	.006	0.58	26.1
	2.5	1.58	0.35	18.7	78	9.46	0.93	.025	1.31	25.6
	3.5	2.21	0.65	28.4	78	13.2	1.30	.046	2.00	25.6
	4.5	2.84	1.05	45.0	78	17.0	1.67	.074	3.16	25.6
	6.0	3.79	1.80	65.2	78	22.7	2.22	.127	4.58	25.6
	8.0	5.05	3.10	91.9	78	30.3	2.96	.218	6.46	25.6
	9.1	5.74	3.90	110.1	79	34.4	3.37	.274	7.74	26.1
M10	1.0	0.63	0.06	3.3	78	3.79	0.37	.004	0.23	25.6
	2.5	1.58	0.35	9.2	78	9.46	0.93	.025	0.65	25.6
	3.5	2.21	0.65	16.9	78	13.2	1.30	.046	1.19	25.6
	6.0	3.79	1.80	33.7	78	22.7	2.22	.127	2.37	25.6
	8.0	5.05	3.10	52.4	78	30.3	2.96	.218	3.68	25.6
	10.4	6.57	5.20	83.8	79	39.4	3.85	.366	5.89	26.1
M20	1.0	0.63	0.06	1.4	78	3.79	0.37	.004	0.10	25.6
	2.5	1.58	0.35	5.4	78	9.46	0.93	.025	0.38	25.6
	3.5	2.21	0.65	9.1	78	13.2	1.30	.046	0.64	25.6
	6.0	3.79	1.80	21.2	78	22.7	2.22	.127	1.49	25.6
	8.0	5.05	3.10	35.4	78	30.3	2.96	.218	2.49	25.6
	10.4	6.57	5.20	54.8	78	39.4	3.85	.366	3.85	25.6

TABLE B-36

FLOW RESISTANCE OF MEMBRANE FILTERS, FLUID: DEIONIZED WATER AT 70-80 F

	ENGLISH UNITS								METRIC UNITS							
				Net ΔP PSID								Net ΔP, kg/cm^2				
				Run Number								Run Number				
TYPE OF FILTER GRADE, ETC.	Flow gpm	gpm/in^2	Tare ΔP psid	1	2	3	4	Avg. ΔP psid	Flow Liters /min	Flow /min kg/cm^2	Tare ΔP_2 kg/cm	1	2	3	4	Avg. ΔP_2 kg/cm
8μ Membrane Mixed Esters Of Cellulose (SCWP-047)	0.2	.126	-0-	0.7	0.8	0.8	1.0	0.83	.76	.07	-	.049	.056	.056	.070	.058
	0.5	.316	0.2	1.7	2.0	2.0	2.2	1.99	1.89	.19	.014	.120	.141	.141	.155	.139
	1.8	1.14	1.95	7.05	7.10	7.55	8.05	7.44	7.16	.67	.137	.496	.499	.531	.566	.523
	3.5	2.21	7.4	14.1	14.9	15.1	16.6	15.2	13.2	1.30	.520	.991	1.05	1.06	1.17	1.07
	5.3	3.35	16.5	21.5	23.0	23.5	23.5	22.9	20.1	1.97	1.16	1.51	1.62	1.65	1.65	1.61
5μ Membrane Mixed Esters Of Cellulose (SMWP-047)	0.2	.126	-0-	1.3	1.4	1.2	1.4	1.33	.76	.07	-	.091	.098	.084	.098	.093
	0.5	.316	0.2	3.1	3.6	3.1	3.6	3.35	1.89	.19	.014	.218	.253	.218	.253	.236
	1.8	1.14	1.95	12.05	13.05	12.05	12.25	12.35	7.16	.67	.137	.847	.918	.847	.861	.868
	3.5	2.21	7.4	24.6	26.3	24.6	25.6	25.3	13.2	1.30	.520	1.73	1.85	1.73	1.80	1.78
	5.3	3.35	16.5	38.5	39.5	36.5	40.5	38.8	20.1	1.97	1.16	2.71	2.78	2.57	2.85	2.73
0.8μ Membrane Mixed Esters Of Cellulose (AABG-047)	0.2	.126	-0-	3.8	5.0	3.95	5.6	4.57	.76	.07	-	.267	.352	.278	.394	.323
	0.5	.316	0.2	9.7	12.0	10.0	13.3	11.2	1.89	.19	.014	.682	.844	.703	.935	.791
	1.8	1.14	1.95	37.55	42.25	37.55	44.05	40.35	7.16	.67	.137	2.64	2.97	2.64	3.10	2.84
	3.5	2.21	7.4	86.1	90.6	100.00	-	92.2	13.2	1.30	.520	6.05	6.37	7.03	-	6.48
0.45μ Membrane Mixed Esters Of Cellulose (HABG-047)	0.2	0.126	-	19.0	18.5			18.75	.76	.07	-	1.34	1.30			1.32
	0.5	.316	0.2	47.3	47.8			47.55	1.89	.19	.014	3.33	3.36			3.35
	0.9	.568	0.54	97.5	92.5			95.0	3.41	.33	.038	6.86	6.50			6.68

TABLE B-37

FLOW RESISTANCE OF TDDW FLOWING HYDRAULIC FLUID

(Mil-H-5606)

Grade Of Wire Cloth	English Units: Flow Rate gpm	English Units: Flow Rate gpm/in²	Tare ΔP, psid	Net ΔP, psid	Temp °F	Metric Units: Flow Rate l/min	Metric Units: Flow Rate l/min cm²	Tare ΔP, kg/cm²	Net ΔP, kg/cm²	Temp °C
30 x 250	2.0	1.26	0.10	1.0	150	7.57	0.74	0.007	0.070	65.6
	3.0	1.89	0.20	1.6	159	11.4	1.11	0.014	0.112	65.6
	4.0	2.53	0.30	2.2	150	15.1	1.48	0.021	0.155	65.6
	5.0	3.16	0.43	3.0	150	18.9	1.85	0.030	0.211	65.6
	7.0	4.42	0.71	4.9	150	26.5	2.59	0.050	0.344	65.6
	9.0	5.65	1.05	6.9	149	34.1	3.33	0.074	0.485	65.0
	10.0	6.31	1.23	8.4	152	37.9	3.70	0.086	0.591	66.7
	2.0	1.26	0.08	1.25	118	7.57	0.74	0.006	0.088	47.8
	3.0	1.89	0.17	2.0	119	11.4	1.11	0.012	0.141	48.3
	4.0	2.53	0.27	2.8	119	15.1	1.48	0.019	0.197	48.3
	5.0	3.16	0.39	3.7	119	18.9	1.85	0.027	0.260	48.3
	7.0	4.42	0.69	5.7	119	26.5	2.59	0.049	0.401	48.3
	10.0	6.31	1.25	9.6	121	37.9	3.70	0.088	0.675	49.4
	2.0	1.26	0.025	1.7	88	7.57	0.74	0.002	0.12	31.1
	3.0	1.89	0.07	2.4	88	11.4	1.11	0.005	0.169	31.1
	4.0	2.53	0.14	3.6	89	15.1	1.48	0.010	0.253	31.7
	5.0	3.16	0.24	5.1	89	18.9	1.85	0.017	0.359	31.7
	7.0	4.42	0.55	7.4	89	26.5	2.59	0.039	0.520	31.7
	10.0	6.31	1.30	11.5	89	37.9	3.70	0.091	0.808	31.7
30 x 370	2.0	1.26	0.10	0.7	149	7.57	0.74	0.007	0.049	65.0
	3.0	1.89	0.20	1.05	147	11.4	1.11	0.014	0.074	63.9
	4.0	2.53	0.30	1.55	147	15.1	1.48	0.021	0.109	63.9
	5.0	3.16	0.43	2.1	148	18.9	1.85	0.030	0.148	64.4
	7.0	4.42	0.71	3.2	149	26.5	2.59	0.050	0.225	65.0
	10.0	6.31	1.23	5.4	153	37.9	3.70	0.086	0.38	67.2
	2.0	1.26	0.08	0.82	122	7.57	0.74	0.006	0.058	50.0
	3.0	1.89	0.17	1.4	122	11.4	1.11	0.012	0.098	50.0
	4.0	2.53	0.27	1.9	121	15.1	1.48	0.019	0.134	49.4
	5.0	3.16	0.39	2.5	121	18.9	1.85	0.027	0.176	49.4
	7.0	4.42	0.69	4.0	117	26.5	2.59	0.049	0.281	47.2
	10.0	6.31	1.25	6.3	117	37.9	3.70	0.088	0.443	47.2
	2.0	1.26	0.025	1.2	87	7.57	0.74	0.002	0.084	30.6
	3.0	1.89	0.07	1.8	87	11.4	1.11	0.005	0.127	30.6
	4.0	2.53	0.14	2.5	88	15.1	1.48	0.010	0.176	31.1
	5.0	3.16	0.24	3.5	88	18.9	1.85	0.017	0.246	31.1
	7.0	4.42	0.55	5.3	88	26.5	2.59	0.039	0.373	31.1
	10.0	6.31	1.30	8.0	88	37.9	3.70	0.091	0.562	31.1
40 x 550	2.0	1.26	0.10	0.75	150	7.57	0.74	0.007	0.053	65.6
	3.0	1.89	0.20	1.2	150	11.4	1.11	0.014	0.084	65.6
	4.0	2.53	0.30	1.7	148	15.1	1.48	0.021	0.12	64.4
	5.0	3.16	0.43	2.2	150	18.9	1.85	0.030	0.155	65.6
	6.0	3.79	0.56	2.7	150	22.7	2.22	0.039	0.19	65.6
	7.0	4.42	0.71	3.5	152	26.5	2.59	0.050	0.246	66.7
	8.0	5.05	0.87	4.1	153	30.3	2.96	0.061	0.288	67.2
	9.0	5.68	1.05	4.9	153	34.1	3.33	0.074	0.344	67.2
	10.0	6.31	1.23	5.6	153	37.9	3.70	0.086	0.394	67.2
	2.0	1.26	0.08	0.94	120	7.57	0.74	0.006	0.066	48.9
	3.0	1.89	0.17	1.5	121	11.4	1.11	0.012	0.105	49.4
	4.0	2.53	0.27	2.1	122	15.1	1.48	0.019	0.148	50.0
	5.0	3.16	0.39	2.7	122	18.9	1.85	0.027	0.19	50.0
	7.0	4.42	0.69	4.4	123	26.5	2.59	0.049	0.309	50.6
	10.0	6.31	1.25	6.6	123	37.9	3.70	0.088	0.464	50.6
	2.0	1.26	0.025	1.1	92	7.57	0.74	0.002	0.077	33.3
	3.0	1.89	0.07	2.0	92	11.4	1.11	0.005	0.141	33.3
	4.0	2.53	0.14	2.9	91	15.1	1.48	0.010	0.204	32.8
	5.0	3.16	0.24	3.7	91	18.9	1.85	0.017	0.260	32.8
	7.0	4.42	0.55	5.6	90	26.5	2.59	0.039	0.394	32.2
	10.0	6.31	1.30	8.5	89	37.9	3.70	0.091	0.598	31.7
80 x 700	2.0	1.26	0.10	2.0	148	7.57	0.74	0.007	0.141	64.4
	3.0	1.89	0.20	3.2	148	11.4	1.11	0.014	0.225	64.4
	4.0	2.53	0.30	4.4	148	15.1	1.48	0.021	0.309	64.4
	5.0	3.16	0.43	5.3	148	18.9	1.85	0.030	0.373	64.4
	7.0	4.42	0.71	7.9	148	26.5	2.59	0.050	0.555	64.4
	10.0	6.31	1.23	13.0	148	37.9	3.70	0.086	0.914	64.4
	2.0	1.26	0.08	2.5	120	7.57	0.74	0.006	0.176	48.9
	3.0	1.89	0.17	3.9	120	11.4	1.11	0.012	0.274	48.9
	4.0	2.53	0.27	5.5	119	15.1	1.48	0.019	0.387	48.3
	5.0	3.16	0.39	6.9	118	18.9	1.85	0.027	0.485	47.8
	7.0	4.42	0.69	10.0	119	26.5	2.59	0.049	0.703	48.3
	10.0	6.31	1.25	15.5	120	37.9	3.70	0.088	1.09	48.9
	2.0	1.26	0.025	3.5	90	7.57	0.74	0.002	0.246	32.2
	3.0	1.89	0.07	6.0	90	11.4	1.11	0.005	0.422	32.2
	4.0	2.53	0.14	8.0	90	15.1	1.48	0.010	0.562	32.2
	5.0	3.16	0.24	10.0	88	18.9	1.85	0.017	0.703	31.1
	7.0	4.42	0.55	14.5	88	26.5	2.59	0.039	1.019	31.1
	10.0	6.31	1.30	24.0	89	37.9	3.70	0.091	1.687	31.7
165 x 1400	2.0	1.26	0.10	4.3	148	7.57	0.74	0.007	0.302	64.4
	3.0	1.89	0.20	6.4	149	11.4	1.11	0.014	0.45	65.0
	4.0	2.53	0.30	8.7	150	15.1	1.48	0.021	0.612	65.6
	5.0	3.16	0.43	11.0	150	18.9	1.85	0.030	0.773	65.6
	7.0	4.42	0.71	16.0	152	26.5	2.59	0.050	1.125	66.7
	10.0	6.31	1.23	25.0	152	37.9	3.70	0.086	1.758	66.7
	2.0	1.26	0.08	5.7	120	7.57	0.74	0.006	0.401	48.9
	3.0	1.89	0.17	8.2	121	11.4	1.11	0.012	0.576	49.4
	4.0	2.53	0.27	11.5	121	15.1	1.48	0.019	0.808	49.4
	5.0	3.16	0.39	15.0	121	18.9	1.85	0.027	1.055	49.4
	7.0	4.42	0.69	21.0	119	26.5	2.59	0.049	1.476	48.3
	10.0	6.31	1.25	34.0	118	37.9	3.70	0.088	2.390	47.8
	2.0	1.26	0.028	4.1	88	7.57	0.74	0.002	0.309	31.1
	3.0	1.89	0.07	13.5	90	11.4	1.11	0.005	0.949	32.2
	4.0	2.53	0.14	17.0	90	15.1	1.48	0.010	1.195	32.2
	5.0	3.16	0.24	21.0	90	18.9	1.85	0.017	1.476	32.2
	7.0	4.42	0.55	33.0	90	26.5	2.59	0.039	2.32	32.2
	10.0	6.31	1.30	47.0	90	37.9	3.70	0.091	3.304	32.2
200 x 1400	2.0	1.26	0.1	5.4	143	4.77	0.74	0.007	0.38	61.7
	3.0	1.89	0.2	8.4	144	7.15	1.11	0.014	0.591	62.2
	4.0	2.53	0.3	11.5	144	9.58	1.48	0.021	0.808	62.2
	5.0	3.16	0.4	15.0	144	12.0	1.85	0.028	1.055	62.2
	7.0	4.42	0.7	21.0	144	16.7	2.59	0.049	1.476	62.2
	10.0	6.31	1.2	29.5	147	23.9	3.70	0.084	2.074	63.9
	2.0	1.26	0.1	6.4	121	4.77	0.74	0.007	0.45	49.4
	3.0	1.89	0.2	10.5	121	7.15	1.11	0.014	0.738	49.4
	4.0	2.53	0.3	14.5	122	9.58	1.48	0.021	1.019	50.0
	5.0	3.16	0.4	17.5	122	12.0	1.85	0.028	1.230	50.0
	7.0	4.42	0.7	26.0	123	16.7	2.59	0.049	1.828	50.6
	10.0	6.31	1.3	36.0	123	23.9	3.70	0.091	2.531	50.6
	2.0	1.26	-	9.0	92	4.77	0.74	-	0.633	33.3
	3.0	1.89	0.1	14.0	93	7.15	1.11	0.007	0.944	33.9
	4.0	2.53	0.1	19.0	96	9.58	1.48	0.007	1.336	35.6
	5.0	3.16	0.2	24.0	96	12.0	1.85	0.014	1.687	35.6
	7.0	4.42	0.5	33.0	96	16.7	2.59	0.035	2.32	35.6
	10.0	6.31	1.2	47.0	97	23.9	3.70	0.084	3.304	36.1
325 x 2300	1.0	0.63	0.04	7.0	147	3.79	0.37	0.003	0.492	63.9
	1.5	0.95	0.07	9.6	147	5.68	0.56	0.005	0.675	63.9
	2.0	1.26	0.10	12.5	147	7.57	0.74	0.007	0.879	63.9
	2.5	1.58	0.15	17.0	148	9.46	0.93	0.011	1.195	64.4
	3.0	1.89	0.20	19.0	148	11.4	1.11	0.014	1.336	64.4
	3.5	2.21	0.25	23.0	148	13.2	1.30	0.018	1.617	64.4
	4.0	2.53	0.30	27.0	148	15.1	1.48	0.021	1.898	64.4
	5.0	3.16	0.43	34.0	150	18.9	1.85	0.030	2.390	65.6
	6.33	4.00	0.60	42.0	150	24.0	2.35	0.042	2.953	65.6
	1.0	0.63	0.03	8.8	120	3.79	0.37	0.002	0.619	48.9
	1.5	0.95	0.05	12.9	120	5.68	0.56	0.004	0.907	48.9
	2.0	1.26	0.08	16.6	121	7.57	0.74	0.006	1.167	49.4
	2.5	1.58	0.12	21.0	121	9.46	0.93	0.008	1.476	49.4
	3.0	1.89	0.17	26.0	122	11.4	1.11	0.012	1.828	50.0
	3.5	2.21	0.21	31.0	122	13.2	1.30	0.015	2.179	50.0
	1.0	0.63	0.01	11.0	90	3.79	0.37	0.001	0.773	32.2
	1.5	0.95	0.01	17.0	95	5.68	0.56	0.001	1.195	35.0
	2.0	1.26	0.03	24.0	95	7.57	0.74	0.002	1.687	35.0
	2.5	1.58	0.04	30.0	96	9.46	0.93	0.003	2.109	35.6
	3.0	1.89	0.07	33.0	96	11.4	1.11	0.005	2.32	35.6
	3.5	2.21	0.10	40.0	94	13.2	1.30	0.007	2.812	34.4

TABLE B-38

FLOW RESISTANCE OF PDSN WIRE CLOTH

Fluid: MIL-H-5606 Hydraulic Fluid

Grade Of Wire Cloth	ENGLISH UNITS: Flow Rate gpm	ENGLISH UNITS: Flow Rate gpm/in^2	Tare ΔP, psid	Net ΔP, psid	Temp °F	METRIC UNITS: Flow Rate l/min	METRIC UNITS: Flow Rate l/min/cm^2	Tare ΔP, kg/cm^2	Net ΔP, kg/cm^2	Temp °C
30 x 150	2.0	1.26	0.10	0.29	150	7.57	0.74	0.007	0.020	65.6
	3.0	1.89	0.20	0.44	150	11.4	1.11	0.014	0.031	65.6
	4.0	2.53	0.30	0.65	151	15.1	1.48	0.021	0.046	66.1
	5.0	3.16	0.43	0.83	151	18.9	1.85	0.030	0.058	66.1
	7.0	4.42	0.71	1.15	152	26.5	2.59	0.050	0.081	66.7
	10.0	6.31	1.23	1.87	152	37.9	3.70	0.086	0.132	66.7
	2.0	1.26	0.08	0.35	119	7.57	0.74	0.006	0.025	48.3
	3.0	1.89	0.17	0.54	119	11.4	1.11	0.012	0.038	48.3
	4.0	2.53	0.27	0.73	119	15.1	1.48	0.019	0.051	48.3
	5.0	3.16	0.39	1.0	119	18.9	1.85	0.027	0.070	48.3
	7.0	4.42	0.69	1.5	119	26.5	2.59	0.049	0.105	48.3
	10.0	6.31	1.25	2.3	119	37.9	3.70	0.088	0.162	48.3
	2.0	1.26	0.025	0.52	88	7.57	0.74	0.002	0.037	31.1
	3.0	1.89	0.07	0.8	88	11.4	1.11	0.005	0.056	31.1
	4.0	2.53	0.14	1.0	88	15.1	1.48	0.010	0.070	31.1
	5.0	3.16	0.24	1.4	88	18.9	1.85	0.017	0.098	31.7
	7.0	4.42	0.55	2.2	90	26.5	2.59	0.039	0.155	32.2
	10.0	6.31	1.30	3.0	91	37.9	3.70	0.091	0.211	32.8
80 x 400	2.0	1.26	0.10	0.65	152	7.57	0.74	0.007	0.046	66.7
	3.0	1.89	0.20	0.97	152	11.4	1.11	0.014	0.068	66.7
	4.0	2.53	0.30	1.4	151	15.1	1.48	0.021	0.098	66.1
	5.0	3.16	0.43	1.8	151	18.9	1.85	0.030	0.127	66.1
	7.0	4.42	0.71	2.5	151	26.5	2.59	0.050	0.176	66.1
	10.0	6.31	1.25	4.1	151	37.9	3.70	0.086	0.288	66.1
	2.0	1.26	0.08	0.8	119	7.57	0.74	0.006	0.056	48.3
	3.0	1.89	0.17	1.3	119	11.4	1.11	0.012	0.091	48.3
	4.0	2.53	0.27	1.8	120	15.1	1.48	0.019	0.127	48.9
	5.0	3.16	0.39	2.3	121	18.9	1.85	0.027	0.162	49.4
	7.0	4.42	0.69	3.2	122	26.5	2.59	0.049	0.225	50.0
	10.0	6.31	1.25	5.1	122	37.9	3.70	0.088	0.359	50.0
	2.0	1.26	0.025	1.2	91	7.57	0.74	0.002	0.084	32.8
	3.0	1.89	0.07	1.8	92	11.4	1.11	0.005	0.127	33.3
	4.0	2.53	0.14	2.5	92	15.1	1.48	0.010	0.176	33.3
	5.0	3.16	0.24	3.0	92	18.9	1.85	0.017	0.211	33.3
	7.0	4.42	0.55	4.3	92	26.5	2.59	0.039	0.302	33.3
	10.0	6.31	1.30	6.3	93	37.9	3.70	0.091	0.443	33.9
165 x 800	2.0	1.26	0.10	1.0	149	7.57	0.74	0.007	0.070	65.0
	3.0	1.89	0.20	1.6	149	11.4	1.11	0.014	0.112	65.0
	4.0	2.53	0.30	2.3	151	15.1	1.48	0.021	0.162	66.1
	5.0	3.16	0.43	2.9	151	18.9	1.85	0.030	0.204	66.1
	7.0	4.42	0.71	3.9	152	26.5	2.59	0.050	0.274	66.7
	10.0	6.31	1.23	6.4	152	37.9	3.70	0.086	0.45	66.7
	2.0	1.26	0.08	1.5	120	7.57	0.74	0.006	0.105	48.9
	3.0	1.89	0.17	2.3	120	11.4	1.11	0.012	0.162	48.9
	4.0	2.53	0.27	3.0	120	15.1	1.48	0.019	0.211	48.9
	5.0	3.16	0.39	3.7	121	18.9	1.85	0.027	0.260	49.4
	7.0	4.42	0.69	5.2	121	26.5	2.59	0.049	0.366	49.4
	10.0	6.31	1.25	7.5	120	37.9	3.70	0.088	0.527	48.9
	2.0	1.26	0.025	2.2	88	7.57	0.74	0.002	0.155	31.1
	3.0	1.89	0.07	3.5	88	11.4	1.11	0.005	0.246	31.1
	4.0	2.53	0.14	4.5	88	15.1	1.48	0.010	0.316	31.1
	5.0	3.16	0.24	5.5	88	18.9	1.85	0.017	0.387	31.1
	7.0	4.42	0.55	8.0	88	26.5	2.59	0.039	0.562	31.1
	10.0	6.31	1.30	11.5	88	37.9	3.70	0.091	0.808	31.1
180 x 900	2.0	1.26	0.10	1.3	150	7.57	0.74	0.007	0.091	65.6
	3.0	1.89	0.20	2.0	151	11.4	1.11	0.014	0.141	66.1
	4.0	2.53	0.30	2.7	150	15.1	1.48	0.021	0.19	65.6
	5.0	3.16	0.43	3.2	152	18.9	1.85	0.030	0.225	66.7
	7.0	4.42	0.71	4.5	151	26.5	2.59	0.050	0.316	66.1
	10.0	6.31	1.23	6.4	151	37.9	3.70	0.086	0.45	66.1
	2.0	1.26	0.08	1.5	119	7.57	0.74	0.006	[illegible]	48.3
	3.0	1.89	0.17	2.5	118	11.4	1.11	0.012	[illegible]	47.8
	4.0	2.53	0.27	3.4	119	15.1	1.48	0.019	[illegible]	48.3
	5.0	3.16	0.39	4.0	119	18.9	1.85	0.027	0.281	48.3
	7.0	4.42	0.69	6.0	120	26.5	2.59	0.049	0.422	48.9
	10.0	6.31	1.25	8.3	122	37.9	3.70	0.088	0.583	50.0
	2.0	1.26	0.025	2.2	93	7.57	0.74	0.002	0.155	33.9
	3.0	1.89	0.07	3.2	93	11.4	1.11	0.005	0.225	33.9
	4.0	2.53	0.14	4.3	94	15.1	1.48	0.010	0.302	34.4
	5.0	3.16	0.24	5.7	95	18.9	1.85	0.017	0.401	35.0
	7.0	4.42	0.55	7.7	94	26.5	2.59	0.039	0.541	34.4
	10.0	6.31	1.30	12.0	92	37.9	3.70	0.091	0.844	33.3

TABLE B-39

FLOW RESISTANCE OF PLAIN SQUARE MESH WIRE

Fluid: MIL-H-5606 Hydraulic Fluid

Grade Of Wire Cloth	ENGLISH UNITS Flow Rate gpm	ENGLISH UNITS Flow Rate gpm/in²	Tare ΔP, psid	Net ΔP, psid	Temp °F	METRIC UNITS Flow Rate l/min	METRIC UNITS Flow Rate l/min cm²	Tare ΔP, kg/cm²	Net ΔP, kg/cm²	Temp °C
100 x 100	2.0	1.26	0.10	0.12	155	7.57	0.74	0.007	0.008	68.3
	3.0	1.89	0.20	0.19	154	11.4	1.11	0.014	0.013	67.8
	4.0	2.53	0.30	0.27	154	15.1	1.48	0.021	0.019	67.8
	5.0	3.16	0.43	0.30	154	18.9	1.85	0.030	0.021	67.8
	7.0	4.42	0.71	0.57	155	26.5	2.59	0.050	0.040	68.3
	10.0	6.31	1.23	0.80	155	37.9	3.70	0.086	0.056	68.3
	2.0	1.26	0.08	0.18	117	7.57	0.74	0.006	0.013	47.2
	3.0	1.89	0.17	0.29	117	11.4	1.11	0.012	0.020	47.2
	4.0	2.53	0.27	0.37	117	15.1	1.48	0.019	0.026	47.2
	5.0	3.16	0.39	0.49	117	18.9	1.85	0.027	0.034	47.2
	7.0	4.42	0.69	0.65	117	26.5	2.59	0.049	0.046	47.2
	10.0	6.31	1.25	0.82	119	37.9	3.70	0.088	0.058	48.3
	2.0	1.26	0.025	0.23	87	7.57	0.74	0.002	0.016	30.6
	3.0	1.89	0.07	0.36	87	11.4	1.11	0.005	0.025	30.6
	4.0	2.53	0.14	0.45	88	15.1	1.48	0.010	0.032	31.1
	5.0	3.16	0.24	0.61	89	18.9	1.85	0.017	0.043	31.7
	7.0	4.42	0.55	0.87	89	26.5	2.59	0.039	0.061	31.7
	10.0	6.31	1.30	1.10	91	37.9	3.70	0.091	0.077	32.8
150 x 150	2.0	1.26	0.10	0.12	150	7.57	0.74	0.007	0.008	65.6
	3.0	1.89	0.20	0.20	152	11.4	1.11	0.014	0.014	66.7
	4.0	2.53	0.30	0.27	152	15.1	1.48	0.021	0.019	66.7
	5.0	3.16	0.43	0.42	155	18.9	1.85	0.030	0.03	68.3
	7.0	4.42	0.71	0.53	155	26.5	2.59	0.050	0.037	68.3
	10.0	6.31	1.23	0.87	156	37.9	3.70	0.086	0.061	68.9
	2.0	1.26	0.08	0.14	119	7.57	0.74	0.006	0.01	48.3
	3.0	1.89	0.17	0.23	119	11.4	1.11	0.012	0.016	48.3
	4.0	2.53	0.27	0.39	119	15.1	1.48	0.019	0.027	48.3
	5.0	3.16	0.39	0.48	120	18.9	1.85	0.027	0.034	48.9
	7.0	4.42	0.69	0.65	122	26.5	2.59	0.049	0.046	50.0
	10.0	6.31	1.25	1.10	122	37.9	3.70	0.088	0.077	50.0
	2.0	1.26	0.025	0.23	88	7.57	0.74	0.002	0.016	31.1
	3.0	1.89	0.07	0.36	88	11.4	1.11	0.005	0.025	31.1
	4.0	2.53	0.14	0.50	89	15.1	1.48	0.010	0.035	31.7
	5.0	3.16	0.24	0.59	90	18.9	1.85	0.017	0.041	32.2
	7.0	4.42	0.55	0.81	92	26.5	2.59	0.039	0.057	33.3
	10.0	6.31	1.30	1.25	93	37.9	3.70	0.091	0.088	33.9
200 x 200	2.0	1.26	0.10	0.11	155	7.57	0.74	0.007	0.008	68.3
	3.0	1.89	0.20	0.16	155	11.4	1.11	0.014	0.011	68.3
	4.0	2.53	0.30	0.25	155	15.1	1.48	0.021	0.018	68.3
	5.0	3.16	0.43	0.35	155	18.9	1.85	0.030	0.025	68.3
	7.0	4.42	0.71	0.51	155	26.5	2.59	0.050	0.036	68.3
	10.0	6.31	1.23	0.90	156	37.9	3.70	0.086	0.063	68.9
	2.0	1.26	0.08	0.16	119	7.57	0.74	0.006	0.011	48.3
	3.0	1.89	0.17	0.26	119	11.4	1.11	0.012	0.018	48.3
	4.0	2.53	0.27	0.32	119	15.1	1.48	0.019	0.022	48.3
	5.0	3.16	0.39	0.47	119	18.9	1.85	0.027	0.033	48.3
	7.0	4.42	0.69	0.70	119	26.5	2.59	0.049	0.05	48.3
	10.0	6.31	1.25	1.10	121	37.9	3.70	0.088	0.077	49.4
	2.0	1.26	0.025	0.21	88	7.57	0.74	0.002	0.015	31.1
	3.0	1.89	0.07	0.30	89	11.4	1.11	0.005	0.021	31.7
	4.0	2.53	0.14	0.41	90	15.1	1.48	0.010	0.029	32.2
	5.0	3.16	0.24	0.56	91	18.9	1.85	0.017	0.04	32.8
	7.0	4.42	0.55	0.87	92	26.5	2.59	0.039	0.061	33.3
	10.0	6.31	1.30	1.40	94	37.9	3.70	0.091	0.098	34.4
250 x 250	2.0	1.26	0.10	0.16	155	7.57	0.74	0.007	0.011	68.3
	3.0	1.89	0.20	0.26	156	11.4	1.11	0.014	0.018	68.9
	4.0	2.53	0.30	0.38	154	15.1	1.48	0.021	0.027	67.8
	5.0	3.16	0.43	0.48	154	18.9	1.85	0.030	0.034	67.8
	7.0	4.42	0.71	0.71	153	26.5	2.59	0.050	0.05	67.2
	10.0	6.31	1.23	1.20	153	37.9	3.70	0.086	0.084	67.2
	2.0	1.26	0.08	0.23	121	7.57	0.74	0.006	0.162	49.4
	3.0	1.89	0.17	0.36	121	11.4	1.11	0.012	0.025	49.4
	4.0	2.53	0.27	0.47	121	15.1	1.48	0.019	0.033	49.4
	5.0	3.16	0.39	0.61	121	18.9	1.85	0.027	0.043	49.4
	7.0	4.42	0.69	0.96	121	26.5	2.59	0.049	0.067	49.4
	10.0	6.31	1.25	1.50	121	37.9	3.70	0.088	0.105	49.4
	2.0	1.26	0.025	0.31	89	7.57	0.74	0.002	0.022	31.7
	3.0	1.89	0.07	0.45	89	11.4	1.11	0.005	0.032	31.7
	4.0	2.53	0.11	0.63	91	15.1	1.48	0.010	0.048	32.8
	5.0	3.16	0.24	0.86	92	18.9	1.85	0.017	0.060	33.3
	7.0	4.42	0.55	1.20	93	26.5	2.59	0.039	0.084	33.9
	10.0	6.31	1.30	1.90	93	37.9	3.70	0.091	0.134	33.9

TABLE B-40

FLOW RESISTANCE OF TDDW AND PDSW FLOWING ETHYLENE GLYCOL AND WATER

(35%/65% by Weight)

Grade Of Wire Cloth	ENGLISH UNITS: Flow Rate gpm	ENGLISH UNITS: Flow Rate gpm/in²	Tare ΔP, psid	Net ΔP, psid	Temp °F	METRIC UNITS: Flow Rate 1/min	METRIC UNITS: Flow Rate 1/min cm²	Tare ΔP, kg/cm²	Net ΔP, kg/cm²	Temp °C
325 x 2300 TDDW	1.7	1.07	0.06	3.8	74	6.43	0.63	0.004	0.267	23.3
	2.1	1.33	0.09	4.9	74	7.95	0.78	0.006	0.345	23.3
	2.5	1.58	0.11	5.8	74	9.46	0.93	0.008	0.408	23.3
	3.4	2.15	0.19	7.7	74	12.9	1.26	0.013	0.541	23.3
	3.84	2.42	0.23	9.0	74	14.5	1.42	0.016	0.633	23.3
165 x 1400 TDDW	1.78	1.12	0.07	1.67	72	6.74	0.66	0.005	0.117	22.2
	2.2	1.39	0.09	2.1	72	8.33	0.82	0.006	0.148	22.2
	2.5	1.58	0.11	2.45	72	9.46	0.93	0.008	0.172	22.2
	2.9	1.83	0.14	2.85	72	11.0	1.07	0.010	0.200	22.2
	3.17	2.00	0.16	3.2	72	12.0	1.17	0.011	0.225	22.2
	3.47	2.19	0.19	3.5	72	13.1	1.28	0.013	0.246	22.2
200 x 1400 TDDW	1.86	1.17	0.07	1.85	72	7.04	0.69	0.005	0.130	22.2
	2.24	1.41	0.10	2.25	72	8.49	0.83	0.007	0.158	22.2
	2.54	1.60	0.12	2.6	72	9.61	0.94	0.008	0.183	22.2
	2.92	1.84	0.15	3.1	72	11.1	1.08	0.011	0.218	22.2
	3.2	2.02	0.17	3.4	72	12.1	1.18	0.012	0.239	22.2
	3.6	2.27	0.20	4.0	72	13.6	1.33	0.014	0.281	22.2
165 x 800 PDSW	1.52	0.96	0.05	0.30	72	5.75	0.56	0.004	0.021	22.2
	1.73	1.09	0.06	0.35	72	6.55	0.64	0.004	0.025	22.2
	2.0	1.26	0.08	0.40	72	7.57	0.74	0.006	0.028	22.2
	2.7	1.70	0.13	0.55	72	10.2	1.00	0.009	0.039	22.2
	3.4	2.15	0.19	0.73	72	12.9	1.26	0.013	0.051	22.2
80 x 400 PDSW	1.69	1.07	0.06	0.16	76	6.40	0.63	0.004	0.011	24.4
	1.86	1.17	0.07	0.22	76	7.04	0.69	0.005	0.015	24.4
	2.28	1.44	0.10	0.30	76	8.63	0.84	0.007	0.021	24.4
	2.70	1.70	0.13	0.35	76	10.2	1.00	0.009	0.025	24.4
	3.0	1.89	0.15	0.40	76	11.4	1.11	0.011	0.028	24.4
30 x 150 PDSW	1.78	1.12	0.07	0.10	76	6.74	0.66	0.005	0.007	24.4
	2.32	1.46	0.10	0.15	76	8.78	0.86	0.008	0.011	24.4
	2.79	1.76	0.14	0.19	76	10.6	1.03	0.010	0.013	24.4
	3.42	2.16	0.19	0.25	76	12.9	1.27	0.013	0.018	24.4
2 x 120 x 650 PDSW	1.02	0.64	0.010	0.37	71	3.85	1.52	0.0007	0.026	21.6
	1.51	0.95	0.030	0.43	71	5.71	2.25	0.002	0.030	21.6
	2.00	1.26	0.045	0.54	71	7.56	2.98	0.003	0.038	21.6
	3.02	1.91	0.090	0.73	71	11.42	4.50	0.006	0.051	21.6
	3.99	2.52	0.145	0.96	71	15.08	5.94	0.010	0.068	21.6
	4.97	3.14	0.200	1.23	71	18.79	7.40	0.014	0.086	21.6
	5.99	3.78	0.260	1.57	71	22.64	8.91	0.018	0.110	21.6
	6.97	4.40	0.330	1.89	71	26.35	10.37	0.023	0.133	21.6
	7.90	5.04	0.410	2.30	71	29.86	11.76	0.029	0.162	21.6
	9.01	5.69	0.500	2.71	71	34.06	13.41	0.035	0.191	21.6
	9.98	6.30	0.590	3.16	71	37.72	14.85	0.042	0.222	21.6
	11.00	6.95	0.660	3.72	71	41.58	16.37	0.047	0.262	21.6
30 x 160 PDSW	1.02	0.64	0.010	0.07	70	3.85	1.52	0.0007	0.005	21.1
	1.51	0.95	0.030	0.09	70	5.71	2.25	0.002	0.006	21.1
	2.00	1.26	0.045	0.12	70	7.56	2.98	0.003	0.008	21.1
	3.02	1.91	0.090	0.18	70	11.42	4.50	0.006	0.013	21.1
	3.99	2.52	0.145	0.26	70	15.08	5.94	0.010	0.018	21.1
	4.97	3.14	0.020	0.40	70	18.79	7.40	0.014	0.028	21.1
	5.99	3.78	0.260	0.54	70	22.64	8.91	0.018	0.038	21.1
	6.97	4.40	0.330	0.69	70	26.35	10.37	0.023	0.049	21.1
	7.90	5.04	0.410	0.89	70	29.86	11.76	0.029	0.063	21.1
	9.01	5.69	0.500	1.11	70	34.06	13.41	0.035	0.078	21.1
	9.98	6.30	0.590	1.32	70	37.72	14.85	0.042	0.093	21.1
	11.00	6.95	0.660	1.61	70	41.58	16.37	0.047	0.113	21.1

TABLE B-41

FLOW RESISTANCE OF VARIOUS FILTER MEDIA WITH JP-4 FLUID

Grade Of Wire Cloth	ENGLISH UNITS: Flow Rate gpm	ENGLISH UNITS: Flow Rate gpm/in	ENGLISH UNITS: Tare ΔP, psid	ENGLISH UNITS: Net ΔP, psid	ENGLISH UNITS: Temp °F	METRIC UNITS: Flow Rate l/min	METRIC UNITS: Flow Rate l/min cm	METRIC UNITS: Tare ΔP, kg/cm^2	METRIC UNITS: Net ΔP, kg/cm^2	METRIC UNITS: Temp °C
200 x 200 Plain Square Mesh	2.1	1.33	0.03	0.02	88	7.95	0.78	0.002	0.001	31.1
	2.6	1.64	0.04	0.05	89	9.84	0.96	0.003	0.004	31.7
	3.95	2.49	0.10	0.09	89	15.0	1.46	0.007	0.006	31.7
	5.1	3.22	0.16	0.16	89	19.3	1.89	0.011	0.011	31.7
	7.05	4.45	0.32	0.28	89	26.7	2.61	0.022	0.020	31.7
	9.98	6.30	0.63	0.52	87	37.8	3.70	0.044	0.037	30.6
400 x 400 Twilled Square Mesh	2.0	1.26	0.03	0.02	83	7.57	0.74	0.002	0.001	28.3
	3.0	1.89	0.06	0.06	83	11.4	1.11	0.004	0.004	28.3
	3.9	2.46	0.10	0.12	91	14.8	1.44	0.007	0.008	32.8
	5.0	3.16	0.16	0.18	80	18.9	1.85	0.011	0.013	26.7
	6.9	4.36	0.32	0.31	83	26.1	2.56	0.022	0.022	28.3
	10.3	6.50	0.67	1.04	87	39.0	3.81	0.047	0.073	30.6
80 x 400 PDSW	2.3	1.45	0.03	0.09	80	8.71	0.85	0.002	0.006	26.7
	3.2	2.02	0.06	0.16	80	12.1	1.18	0.004	0.011	26.7
	4.0	2.53	0.10	0.24	80	15.1	1.48	0.007	0.017	26.7
	5.2	3.28	0.17	0.37	84	19.7	1.92	0.012	0.026	28.9
	7.1	4.48	0.33	0.65	86	26.9	2.63	0.023	0.046	30.0
	10.3	6.50	0.67	1.33	89	39.0	3.81	0.047	0.094	31.7
165 x 800 PDSW	2.04	1.29	0.03	0.27	84	7.72	0.76	0.002	0.019	28.9
	3.06	1.93	0.06	0.55	85	11.6	1.13	0.004	0.039	29.4
	4.0	2.53	0.10	0.75	85	15.1	1.48	0.007	0.053	29.4
	5.06	3.19	0.16	1.04	87	19.2	1.87	0.011	0.073	30.6
	6.9	4.36	0.32	1.51	89	26.1	2.56	0.022	0.106	31.7
	9.54	6.02	0.58	2.12	85	36.1	3.53	0.041	0.149	29.4
164 x 1400 TDDW	2.08	1.31	0.03	0.52	85	7.87	0.77	0.002	0.037	29.4
	3.06	1.93	0.06	0.86	87	11.6	1.13	0.004	0.060	30.6
	4.0	2.53	0.10	1.3	87	15.1	1.48	0.007	0.091	30.6
	5.1	3.22	0.16	1.9	88	19.3	1.89	0.011	0.134	31.1
	7.1	4.48	0.32	3.3	88	26.9	2.63	0.022	0.232	31.1
	9.85	6.22	0.62	5.4	86	37.3	3.65	0.044	0.380	30.0
325 x 2300 TDDW	2.0	1.26	0.03	1.2	88	7.57	0.74	0.002	0.084	31.1
	3.02	1.91	0.06	2.0	90	11.4	1.12	0.004	0.141	32.2
	3.99	2.52	0.10	2.7	90	15.1	1.48	0.007	0.190	32.2
	5.01	3.15	0.16	3.8	90	19.0	1.85	0.011	0.267	32.2
	7.05	4.45	0.31	5.9	91	26.7	2.61	0.022	0.415	32.8
	9.23	5.83	0.56	8.6	90	34.9	3.42	0.039	0.605	32.2

TABLE B-42

FLOW RESISTANCE OF 30 x 250 TDDW WIRE CLOTH

Fluid: Gaseous Nitrogen

Inlet Press. psia	Flow, SCFM	SCFM/in²	ACFM/in²	Tare ΔP psid	Sample 1 Net ΔP psid	Sample 1 Temp °F	Sample 2 Net ΔP psid	Sample 2 Temp °F	Avg. ΔP psid	Avg. Temp °F
50	0.84	2.53	0.74	.005	.010	78	.015	78	.013	78
	1.76	5.30	1.56	.025	.065	78	.075	78	.070	78
	2.65	7.98	2.35	.063	.137	78	.137	78	.137	78
	3.06	9.22	2.71	.087	.173	78	.173	78	.173	78
	4.25	12.80	3.76	.180	.390	78	.390	78	.390	78
400	5.6	16.9	0.62	.024	.056	71	.056	73	.056	72
	8.5	25.6	0.94	.047	.113	71	.093	73	.103	72
	17.0	51.2	1.88	.145	.455	70	.475	73	.465	71.5
	25.5	76.8	2.82	.28	1.12	68	1.17	71	1.15	69.5
	34.0	102.4	3.76	.45	2.05	66	2.15	68	2.10	67
	40.0	120.4	4.43	.59	2.91	64	3.11	66	3.01	65
500	8.6	25.9	0.76	0.06	.100	75	.100	76	.100	75.5
	16.7	50.3	1.48	0.22	.380	75	.410	75	.395	75
	25.3	76.2	2.24	0.52	.880	73	.980	74	.930	73.5
	29.9	90.1	2.65	0.71	1.39	73	1.79	73	1.59	73
	42.8	128.9	3.79	1.45	2.95	70	3.05	71	3.00	70.5
1500	25.5	76.8	0.75	0.1	0.36	77	0.35	76	0.36	76.5
	42.3	128	1.25	0.26	1.09	76	1.14	76	1.12	76
	53.0	160	1.57	0.37	1.53	76	1.33	74	1.43	75
	85.0	256	2.51	0.95	3.85	75	4.25	74	4.05	74.5
	102	307	3.01	1.5	5.30	74	5.10	73	5.20	73.5
	133	401	3.93	2.4	9.60	74	9.60	73	9.60	73.5

TABLE B-43

FLOW RESISTANCE OF 80 x 700 TDDW WIRE CLOTH

Fluid: Gaseous Nitrogen

Inlet Press. psia	Flow, SCFM	$\frac{SCFM}{in^2}$	$\frac{ACFM}{in^2}$	Tare ΔP psid	Sample Number 1 Net ΔP psid	Sample Number 1 Temp °F	Sample Number 2 Net ΔP psid	Sample Number 2 Temp °F	Avg. ΔP psid	Avg. Temp °F
50	0.84	2.53	0.74	.005	.025	78	.025	73	.025	75.5
	1.76	5.30	1.56	.025	.075	78	.075	73	.075	75.5
	2.65	7.98	2.35	.063	.137	78	.147	73	.142	75.5
	3.06	9.22	2.71	.087	.173	78	.183	73	.178	75.5
	4.25	12.80	3.76	.180	.380	78	.400	73	.390	75.5
400	5.6	16.9	0.62	.024	.036	80	.056	75	.046	77.5
	8.5	25.6	0.94	.047	.103	79	.123	75	.113	77
	17.0	51.2	1.88	.145	.435	79	.415	74	.425	76.5
	25.5	76.8	2.82	.28	1.02	79	1.02	73	1.02	76
	34.0	102.4	3.76	.45	1.85	76	1.85	70	1.85	73
	40.0	120.4	4.43	.59	2.71	74	2.61	68	2.66	71
500	8.6	25.9	0.76	0.06	.095	78	.100	73	.098	75.5
	16.7	50.3	1.48	0.22	.370	76	.380	72	.375	74
	25.3	76.2	2.24	0.52	.830	73	.730	70	.780	71.5
	29.9	90.1	2.65	0.71	1.14	70	1.19	68	1.17	69
	42.8	128.9	3.79	1.45	2.55	68	2.55	67	2.55	67.5
1500	25.5	76.8	0.75	0.1	0.34	77	0.33	77	0.34	77
	42.5	128	1.25	0.26	1.04	77	0.99	77	1.02	77
	53.0	160	1.57	0.37	1.23	75	1.33	75	1.28	75
	85.0	256	2.51	0.95	3.35	74	3.35	74	3.35	74
	102	307	3.01	1.5	4.30	74	4.25	74	4.28	74
	133	401	3.93	2.4	8.60	74	8.60	74	8.60	74

TABLE B-44

FLOW RESISTANCE OF 165 x 1400 TDDW WIRE CLOTH

Fluid: Gaseous Nitrogen

Inlet Press. psia	Flow, SCFM	SCFM/in^2	ACFM/in^2	Tare ΔP psid	Sample Number 1 Net ΔP psid	Sample Number 1 Temp °F	Sample Number 2 Net ΔP psid	Sample Number 2 Temp °F	Avg. ΔP psid	Avg. Temp °F
50	0.84	2.53	0.74	.005	.035	76	.035	79	.035	77.5
	1.76	5.30	1.56	.025	.105	76	.105	79	.105	77.5
	2.65	7.98	2.35	.063	.177	76	.187	79	.182	77.5
	3.06	9.22	2.71	.087	.223	76	.233	79	.228	77.5
	4.25	12.80	3.76	.180	.460	76	.440	78	.450	77
400	5.6	16.9	0.62	.024	.051	80	.046	77	.049	78.5
	8.5	25.6	0.94	.047	.123	79	.113	76	.118	77.5
	17.0	51.2	1.88	.145	.445	79	.475	76	.460	77.5
	25.5	76.8	2.82	.28	1.07	78	1.12	75	1.10	76.5
	34.0	102.4	3.76	.45	1.90	76	2.05	75	1.98	75.5
	40.0	120.4	4.43	.59	2.61	76	2.91	75	2.76	75.5
500	8.6	25.9	0.76	0.06	0.10	68	0.10	76	0.10	72
	16.7	50.3	1.48	0.22	0.39	65	0.38	74	0.385	69.5
	25.3	76.2	2.24	0.52	0.88	64	0.88	74	0.88	69
	29.9	90.1	2.65	0.71	1.29	63	1.29	72	1.29	67.5
	42.8	128.9	3.79	1.45	2.75	62	2.85	72	2.80	67
1500	25.5	76.8	0.75	0.1	0.34	78	0.37	77	0.36	77.5
	42.5	128	1.23	0.26	1.04	77	1.09	76	1.07	76.5
	53.0	160	1.57	0.37	1.28	74	1.33	75	1.31	74.5
	85.0	256	2.51	0.93	3.45	74	3.65	75	3.55	74.5
	102	307	3.01	1.5	5.70	74	5.40	74	5.55	74
	133	401	3.93	2.4	9.90	73	10.6	73	10.3	73

TABLE B-45

FLOW RESISTANCE OF 325 x 2300 TDDW WIRE CLOTH

Fluid: Gaseous Nitrogen

Inlet Press. psia	Flow, SCFM	$\frac{SCFM}{in^2}$	$\frac{ACFM}{in^2}$	Tare ΔP psid	Sample Number 1 Net ΔP psid	Sample Number 1 Temp °F	Sample Number 2 Net ΔP psid	Sample Number 2 Temp °F	Avg. ΔP psid	Avg. Temp °F
50	0.84	2.53	0.74	.005	.105	78	.095	72	0.10	75
	1.76	5.30	1.56	.025	.245	78	.235	72	0.24	75
	2.65	7.98	2.35	.063	.417	77	.397	72	0.41	74.5
	3.06	9.22	2.71	.087	.503	77	.483	73	0.49	75
	4.25	12.80	3.76	.180	.920	76	.920	73	0.92	74.5
400	5.6	16.9	0.62	.024	.096	80	.096	80	.096	80
	8.5	25.6	0.94	.047	.223	80	.223	80	.223	80
	17.0	51.2	1.88	.145	.765	80	.765	78	.765	79
	25.5	76.8	2.82	.28	1.72	78	1.72	76	1.72	77
	34.0	102.4	3.76	.45	3.05	76	3.00	76	3.03	76
	40.0	120.4	4.43	.59	4.21	76	4.11	76	4.16	76
500	8.6	25.9	0.76	0.06	.19	73	0.18	69	0.19	71
	16.7	50.3	1.48	0.22	.64	73	0.63	68	0.64	70.5
	25.3	76.2	2.24	0.52	1.38	69	1.38	66	1.38	67.5
	29.9	90.1	2.65	0.71	1.94	67	1.89	63	1.92	65
	42.8	128.9	3.79	1.45	4.05	65	3.95	62	4.00	63.5
1500	25.5	76.8	0.75	0.1	0.54	78	0.54	77	0.54	77.5
	42.5	128	1.25	0.26	1.59	78	1.54	77	1.57	77.5
	53.0	160	1.57	0.37	2.03	76	1.88	75	1.96	75.5
	85.0	256	2.51	0.95	4.55	75	4.55	75	4.55	75
	102	307	3.01	1.5	7.00	75	7.00	74	7.00	74.5
	133	401	3.93	2.4	12.1	74	11.8	73	12.0	73.5

TABLE B-46

FLOW RESISTANCE OF 30 x 250 TDDW FLOWING GASEOUS OXYGEN

Test No.	Inlet Press., psia	Area, in²	Temp °F	Flow Rate ACFM/in²	Flow Rate SCFM/in²	Tare ΔP, psid	Net ΔP, psid
7	47.4	0.3167	64.2	0.76	2.47	0.011	0.008
	48.7		65.5	1.57	5.23	0.036	0.046
	48.1		67.2	2.43	8.00	0.080	0.105
	48.1		73.4	3.40	11.04	0.153	0.193
	46.8		79.0	4.37	13.69	0.232	0.313
	51.3		86.5	5.34	18.07	0.409	0.513
	51.3		83.7	4.38	14.90	0.278	0.340
	50.6		81.4	3.42	11.55	0.164	0.222
	49.3		79.1	2.52	8.32	0.086	0.123
	50.0		76.5	1.58	5.32	0.036	0.055
	50.6		73.2	0.76	2.59	0.012	0.013
8	50.5	0.3167	58.3	0.73	2.55	0.012	0.008
	49.9		59.5	1.50	5.20	0.034	0.045
	49.3		62.6	2.34	7.97	0.079	0.097
	49.9		67.3	3.27	11.18	0.156	0.168
	49.3		73.1	4.24	14.14	0.248	0.259
	48.6		83.7	5.24	16.90	0.357	0.414
	50.5		88.5	4.31	14.33	0.253	0.249
	49.3		89.0	3.40	11.00	0.151	0.152
	50.5		84.0	2.41	8.08	0.080	0.097
	50.5		76.1	1.54	5.25	0.036	0.040
	47.3		68.3	0.73	2.34	0.011	0.003
8A	50.5	0.3349	78.7	0.75	2.52	0.012	0.010
	48.0		74.3	1.47	4.75	0.033	0.047
	51.8		71.6	2.16	7.61	0.080	0.103
	48.6		71.7	3.05	10.05	0.140	0.187
	48.0		71.6	3.90	12.69	0.222	0.288
	48.0		72.2	4.87	15.85	0.351	0.441
	48.0		72.1	3.95	12.86	0.229	0.298
	49.3		71.7	3.15	10.51	0.153	0.198
	48.0		71.0	2.25	7.34	0.074	0.116
	50.5		70.9	1.46	5.01	0.036	0.052
	49.3		70.8	0.75	2.50	0.012	0.012
9	49.3	0.3349	65.9	0.75	2.52	0.012	0.010
	51.8		66.6	1.49	5.28	0.040	0.048
	49.3		65.7	2.26	7.65	0.082	0.105
	48.0		66.4	3.09	10.15	0.142	0.179
	47.3		68.0	3.86	12.50	0.215	0.277
	49.9		71.7	4.78	16.18	0.366	0.403
	48.6		73.0	3.90	12.82	0.227	0.273
	51.8		72.9	3.07	10.78	0.161	0.176
	50.5		72.2	2.21	7.56	0.080	0.100
	53.8		72.2	1.44	5.23	0.039	0.045
	50.5		70.6	0.72	2.46	0.012	0.009
11A	400.8	0.3167	71.1	0.73	19.77	0.071	0.067
	400.8		74.7	1.58	42.70	0.208	0.432
	402.1		72.3	2.38	64.83	0.498	0.991
	400.8		72.2	3.23	87.71	0.973	1.811
	399.6		71.8	4.18	113.36	1.701	3.005
	399.6		70.0	5.21	141.72	2.778	5.029
	398.9		68.7	4.18	113.86	1.717	3.012
	402.7		67.5	3.25	89.63	1.024	1.824
	402.1		65.8	2.36	65.23	0.512	0.960
	400.2		68.9	1.58	43.26	0.212	0.437
	401.5		68.9	0.79	21.62	0.076	0.072
10A	398.4	0.3167	84.5	0.76	20.10	0.072	0.064
	399.0		80.4	1.58	42.15	0.202	0.390
	400.3		70.5	2.40	65.33	0.513	0.834
	400.3		69.6	3.27	89.19	1.025	1.688
	399.0		68.6	4.17	113.45	1.720	2.826
	400.9		65.7	5.09	140.09	2.703	4.480
	399.0		65.6	4.13	113.09	1.713	2.780
	397.8		65.4	3.26	88.99	1.007	1.677
	395.2		65.4	2.43	66.07	0.524	0.916
	392.7		65.4	1.56	42.18	0.207	0.368
	376.2		66.0	0.77	19.83	0.071	0.062
11	402.8	0.3167	61.6	0.76	21.11	0.074	0.076
	401.6		66.0	1.56	42.86	0.207	0.416
	400.9		68.1	2.38	65.33	0.519	0.945
	400.9		68.4	3.24	88.77	1.010	1.756
	398.4		67.8	4.20	111.49	1.747	2.972
	400.3		67.1	5.18	141.89	2.785	4.048
	401.6		66.4	4.23	116.31	1.817	3.017
	400.9		66.8	3.28	90.17	1.039	1.818
	400.3		73.7	2.39	64.79	0.505	0.947
	401.6		77.3	1.55	41.73	0.198	0.403
	400.3		75.0	0.79	21.31	0.075	0.075

TABLE B-47

FLOW RESISTANCE OF 80 x 700 TDDW FLOWING GASEOUS OXYGEN

Test No.	Inlet Press., psia	Area in^2	Temp °F	ACFM/in^2	SCFM/in^2	Tare ΔP, psid	Net ΔP, psid
13	51.2	0.3167	75.0	0.82	2.83	0.013	0.021
	51.2		75.9	1.59	5.46	0.038	0.070
	50.5		76.7	2.54	8.63	0.091	0.150
	50.5		76.8	3.44	11.68	0.169	0.270
	50.5		76.4	4.48	15.23	0.289	0.427
	51.2		74.7	5.65	19.52	0.478	0.650
	50.5		73.2	4.51	15.43	0.297	0.434
	50.5		72.8	3.44	4.77	0.172	0.280
	51.2		72.8	2.45	8.50	0.091	0.162
	50.5		72.9	1.57	5.37	0.038	0.078
	51.2		73.2	0.79	2.73	0.013	0.021
14	46.1	0.3167	69.8	0.79	2.48	0.012	0.018
	50.6		72.0	1.52	5.22	0.035	0.063
	51.9		73.8	2.36	8.29	0.086	0.127
	50.0		76.5	3.26	10.96	0.148	0.235
	51.3		78.5	4.29	14.72	0.271	0.364
	49.3		78.0	5.59	18.48	0.427	0.511
	50.6		76.6	4.47	15.20	0.286	0.383
	51.3		74.7	3.47	11.99	0.179	0.248
	49.3		72.7	2.48	8.29	0.086	0.145
	51.9		72.6	1.52	5.34	0.037	0.070
	48.1		72.0	0.79	2.57	0.012	0.019
13A	49.3	0.3349	66.0	0.75	2.52	0.012	0.019
	52.5		70.0	1.47	5.25	0.039	0.067
	49.3		71.6	2.26	7.56	0.080	0.136
	50.5		69.2	3.12	10.75	0.162	0.231
	48.0		68.4	3.93	12.86	0.229	0.353
	51.8		69.4	4.87	17.18	0.413	0.489
	51.2		70.6	3.96	13.79	0.266	0.342
	50.5		71.9	3.09	10.58	0.154	0.228
	51.8		72.5	2.23	7.84	0.086	0.133
	50.5		73.4	1.47	5.01	0.036	0.065
	48.6		73.7	0.75	2.45	0.012	0.018
15	53.8	0.3349	58.3	0.75	2.79	0.014	0.015
	51.2		58.4	1.44	5.13	0.038	0.065
	49.9		59.2	2.23	7.73	0.084	0.129
	51.8		60.2	3.12	11.22	0.176	0.228
	49.9		61.3	3.90	13.45	0.250	0.352
	50.5		65.2	4.69	16.26	0.370	0.497
	49.3		65.6	3.81	12.87	0.233	0.328
	48.0		63.7	2.98	9.85	0.135	0.216
	48.0		61.5	2.19	7.28	0.073	0.128
	51.8		59.5	1.42	5.12	0.038	0.061
	46.7		56.0	0.72	2.34	0.011	0.016
15A	52.5	0.3349	74.4	0.78	2.75	0.014	0.018
	48.6		62.5	1.46	4.91	0.035	0.067
	49.9		66.4	2.24	7.67	0.082	0.139
	48.6		69.9	3.03	10.03	0.138	0.237
	48.6		72.4	3.92	12.92	0.231	0.364
	50.5		74.7	4.81	16.38	0.375	0.529
	51.2		75.7	3.92	13.52	0.253	0.366
	51.2		77.0	3.13	10.77	0.161	0.245
	51.8		77.5	2.26	7.85	0.087	0.138
	50.5		78.3	1.47	4.97	0.036	0.067
	50.5		78.2	0.75	2.53	0.012	0.020

Test No.	Inlet Press., psia	Area in^2	Temp °F	ACFM/in^2	SCFM/in^2	Tare ΔP, psid	Net ΔP, psid
17	399.0	0.3167	62.8	0.79	21.74	0.076	0.106
	404.1		66.8	1.55	42.79	0.209	0.470
	402.6		83.6	2.40	64.01	0.489	1.083
	399.7		80.3	3.23	86.21	0.935	1.957
	401.6		78.0	4.21	113.33	1.705	3.210
	399.7		74.3	5.18	139.76	2.696	5.388
	400.7		68.3	4.22	115.66	1.796	3.292
	400.9		67.1	3.28	89.88	1.037	1.999
	400.3		65.9	2.40	65.81	0.522	1.092
	401.6		65.1	1.55	42.69	0.208	0.473
	399.6		64.4	0.82	22.54	0.078	0.111
16A	402.3	0.3349	67.8	0.72	19.71	0.074	0.081
	400.4		74.7	1.46	39.53	0.199	0.418
	401.1		74.1	2.23	60.53	0.492	0.923
	399.8		66.3	3.10	84.94	1.035	1.763
	401.7		61.0	3.96	110.28	1.829	2.869
	400.4		72.5	4.90	132.85	2.726	4.758
	400.4		84.7	3.98	105.57	1.649	2.865
	399.8		89.5	3.07	80.59	0.921	1.713
	401.7		88.0	2.23	58.91	0.467	0.917
	399.8		83.1	1.46	38.80	-	-
	399.2		73.9	0.75	20.14	0.075	0.080
18	398.0	0.3349	71.9	0.72	19.35	71.9	0.080
	399.3		81.7	1.46	38.78	81.7	0.447
	401.2		71.3	2.25	61.22	71.3	1.058
	399.3		68.2	3.07	83.63	68.2	1.904
	396.7		65.2	3.99	108.79	65.2	3.139
	398.0		71.0	4.90	132.42	71.0	5.181
	397.4		74.4	4.42	118.56	74.4	4.081
	399.3		77.8	3.46	92.75	77.8	2.400
	399.3		78.3	2.68	71.62	78.3	1.427
	401.8		78.5	1.83	49.39	78.5	0.615
	399.3		77.8	1.12	30.06	77.8	0.262
16	397.3	0.3349	69.9	0.75	20.19	0.075	0.078
	399.2		82.9	1.46	38.70	0.192	0.375
	399.8		85.7	2.24	59.15	0.466	0.726
	399.8		72.3	3.16	85.57	1.052	1.554
	401.1		83.5	4.00	106.46	1.690	2.581
	400.4		82.7	4.90	130.35	2.617	4.166
	399.8		81.4	3.97	105.80	1.665	2.584
	399.8		80.7	3.07	81.83	0.955	1.566
	399.8		80.9	2.26	60.28	0.169	0.777
	399.8		81.5	1.48	39.39	0.202	0.310
	401.1		78.8	0.78	20.85	0.077	0.669

TABLE B-48

FLOW RESISTANCE OF 165 x 1400 TDDW FLOWING GASEOUS OXYGEN

Test No.	Inlet Press., psia	Areq, in²	Temp °F	Flow Rate ACFM/in²	Flow Rate SCFM/in²	Tare ∠P, psid	Net ∠P, psid
	48.1		64.5	0.76	2.51	0.011	0.035
	51.3		66.5	1.51	5.31	0.037	0.102
	48.1		70.2	2.38	7.77	0.075	0.176
	51.3		72.7	3.28	11.39	0.162	0.290
	50.6		76.3	4.23	14.42	0.258	0.409
20	49.7	0.3167	79.1	5.43	17.70	0.392	0.553
	50.6		78.9	4.35	14.75	0.271	0.422
	50.6		77.9	3.36	11.40	0.160	0.297
	49.3		75.9	2.41	8.01	0.079	0.187
	48.1		73.1	1.49	4.86	0.031	0.103
	57.1		69.5	0.79	3.07	0.014	0.037
	50.0		74.6	0.79	2.66	0.012	0.032
	50.6		76.7	1.61	5.50	0.038	0.094
	50.6		77.7	2.44	8.28	0.085	0.164
	49.3		78.9	3.41	11.28	0.157	0.265
	48.7		79.7	4.40	14.34	0.254	0.384
19	48.7	0.3167	80.3	5.46	17.76	0.395	0.572
	50.0		80.4	4.44	14.81	0.275	0.389
	49.3		79.7	3.48	11.47	0.163	0.272
	50.0		79.0	2.48	8.29	0.085	0.170
	49.3		77.9	1.57	5.21	0.035	0.094
	50.3		76.1	0.79	2.66	0.012	0.035
	50.6		56.0	0.72	2.53	0.012	0.035
	48.1		59.1	1.40	4.69	0.032	0.098
	50.0		61.9	2.16	7.48	0.077	0.179
	49.3		64.5	3.04	10.33	0.148	0.284
	51.3		66.1	3.86	13.56	0.256	0.404
21	50.0	0.3349	66.4	4.78	16.37	0.375	0.541
	51.9		64.9	3.88	13.84	0.267	0.411
	50.0		63.8	3.08	10.59	0.156	0.293
	49.3		62.2	2.20	7.51	0.079	0.185
	50.6		60.8	1.42	4.97	0.035	0.102
	49.3		60.2	0.72	2.45	0.012	0.037
	401.6		59.9	0.79	22.00	0.077	0.095
	401.6		67.4	1.55	42.50	0.206	0.420
	401.6		70.7	2.37	64.82	0.500	0.959
	400.9		71.3	3.24	88.31	0.998	1.716
23	400.3	0.3167	68.7	4.18	114.10	1.750	2.739
	400.9		67.7	5.21	142.80	2.824	4.450
	399.0		66.7	4.22	115.47	1.789	2.818
	399.7		74.4	3.27	88.18	0.979	1.758
	399.0		85.5	2.38	62.87	0.465	0.964
	399.7		91.5	1.54	40.35	0.187	0.413
	400.9		79.3	0.79	21.17	0.074	0.097
	398.5		78.4	0.75	19.93	0.074	0.090
	408.0		79.7	1.47	40.15	0.203	0.421
	403.0		78.7	2.26	61.01	0.502	0.896
	402.3		77.5	3.10	83.66	1.001	1.610
24	399.8	0.3349	76.4	4.00	107.62	1.727	2.583
	397.3		75.3	4.93	131.93	2.686	4.173
	397.3		75.1	4.45	119.18	2.156	3.277
	403.6		75.7	3.49	94.90	1.315	2.022
	400.4		75.2	2.71	73.15	0.746	1.251
	397.9		75.3	1.84	49.36	0.319	0.599
	397.9		75.4	1.13	30.26	0.124	0.246
	401.8		69.4	0.72	19.62	0.074	0.065
	396.1		77.5	1.46	38.84	0.194	0.335
	402.4		71.7	2.28	62.22	0.516	0.751
	401.2		68.7	3.09	84.66	1.034	1.298
22A	399.3	0.3349	67.6	3.95	107.84	1.736	2.078
	399.3		67.5	4.93	134.55	2.804	3.459
	399.3		73.3	4.02	108.50	1.773	2.152
	398.6		78.2	3.06	81.78	0.939	1.331
	399.9		81.0	2.27	60.45	0.496	0.760
	398.6		81.2	1.45	38.48	0.186	0.340
	399.3		72.8	0.75	20.18	0.075	0.090
	399.9		65.8	0.63	17.21	65.8	0.104
	401.8		66.9	1.45	39.93	66.9	[illegible]
	399.9		71.4	2.23	60.16	71.4	0.752
	398.0		77.2	3.05	81.44	77.2	1.176
22	397.4	0.3349	80.1	3.96	105.03	80.1	2.215
	398.0		76.5	4.90	131.66	76.5	3.803
	395.6		73.3	3.95	107.31	73.3	2.323
	397.4		73.0	3.17	83.23	73.9	1.343
	398.6		76.0	2.22	59.66	76.0	0.839
	397.1		76.2	1.32	37.86	76.2	0.33[illegible]
	398.0		75.2	0.60	16.02	75.2	0.092

FLOW RESISTANCE OF 325 x 2300 [illegible] FLOWING GASEOUS OXYGEN

Test No.	Inlet Press., psia	Area, in²	Temp °F	Flow Rate ACFM/in²	Flow Rate SCFM/in²	Tare ΔP, psid	Net ΔP, psid
	49.3		65.4	0.79	2.67	0.012	0.054
	48.7		67.2	1.54	5.15	0.035	0.215
	50.0		70.2	2.44	8.28	0.085	0.436
	51.3		73.3	3.37	11.69	0.171	0.703
25	48.7	0.3167	76.0	4.33	14.19	0.250	1.014
	49.3		82.7	5.52	18.11	0.410	1.498
	49.3		83.3	4.36	14.27	0.253	1.025
	49.3		82.2	3.41	11.18	0.155	0.671
	48.1		80.6	2.49	7.97	0.080	0.436
	49.3		78.6	1.55	5.14	0.034	0.218
	42.2		69.2	0.77	2.23	0.010	0.107
	49.3		70.0	1.59	5.35	0.038	0.256
	46.7		69.3	2.46	7.82	0.077	0.439
	48.0		69.7	3.27	10.71	0.144	0.673
	47.3		68.8	4.14	13.37	0.222	0.800
25A	48.0	0.3157	70.2	5.16	16.84	0.353	1.312
	49.3		70.9	4.18	13.98	0.243	0.943
	51.8		71.0	3.27	11.50	0.163	0.686
	47.3		71.0	2.40	7.72	0.074	0.445
	51.2		71.4	1.60	5.55	0.040	0.258
	42.2		70.9	0.78	2.24	0.010	0.108
	49.3		67.6	0.72	2.41	0.012	0.090
	48.1		69.3	1.60	5.26	0.036	0.216
	49.3		71.6	2.49	8.33	0.087	0.365
	48.7		72.9	3.45	11.36	0.160	0.561
	49.3		73.9	4.49	14.99	0.278	0.793
26	51.3	0.3349	73.6	5.25	18.23	0.466	1.148
	48.1		72.6	4.35	14.17	0.251	0.832
	46.8		72.3	3.35	10.63	0.140	0.590
	48.7		72.2	2.47	8.17	0.082	0.387
	48.1		71.5	1.53	4.99	0.032	0.230
	51.3		70.7	0.78	2.71	0.013	0.097
	51.2		59.7	0.69	2.44	0.012	0.106
	51.2		61.0	1.43	5.06	0.037	0.259
	51.2		63.4	2.25	7.96	0.089	0.446
	50.5		67.1	3.09	10.70	0.160	0.680
	48.0		72.5	3.99	12.96	0.232	0.937
27	48.6	0.3349	78.5	4.95	16.14	0.364	1.335
	49.3		78.7	3.98	13.14	0.239	0.950
	51.8		76.3	3.05	10.65	0.156	0.692
	48.6		73.2	2.22	7.31	0.074	0.452
	46.7		69.4	1.42	4.51	0.030	0.266
	50.5		64.4	0.72	2.49	0.012	0.111
	399.8		58.5	0.72	19.94	0.074	0.159
	401.7		63.9	1.46	40.46	0.209	0.624
	399.8		66.5	2.25	61.53	0.504	1.363
	402.3		67.7	3.08	84.67	1.021	2.429
	398.5		68.4	3.93	106.84	1.687	3.790
28	399.2	0.3349	68.4	4.87	132.66	2.718	6.086
	399.2		68.5	3.94	107.25	1.721	3.784
	401.1		68.4	3.08	84.47	1.011	2.450
	401.1		68.3	2.26	61.77	0.519	1.367
	399.2		68.1	1.48	40.38	0.211	0.640
	399.8		67.4	0.69	18.77	0.071	0.155
	402.3		57.3	0.81	22.62	0.083	0.191
	400.4		56.6	1.40	39.13	0.197	0.531
	397.9		55.4	2.30	63.93	0.555	1.190
	395.4		57.7	3.08	84.88	1.026	1.962
	396.6		61.1	4.09	109.87	1.809	3.736
28A	394.1	0.3349	64.5	4.78	129.52	2.583	4.769
	399.8		66.4	3.93	108.31	1.743	3.202
	395.4		68.7	3.05	82.21	0.959	2.071
	400.4		70.0	2.22	60.45	0.485	1.204
	398.5		70.7	1.44	38.91	0.193	0.589
	396.0		71.2	0.72	19.27	0.073	0.166
	404.0		72.3	0.72	19.62	0.073	0.208
	403.4		85.8	1.44	38.28	0.185	0.733
	399.6		86.0	2.26	59.76	0.479	1.672
	403.4		83.9	3.03	82.43	0.961	2.986
	399.6		82.1	3.96	105.43	1.659	4.672
30	399.6	0.3349	81.2	4.90	130.45	2.621	7.303
	400.8		80.8	3.94	105.48	1.631	4.733
	398.9		80.5	3.04	80.88	0.930	2.930
	398.9		80.2	2.26	60.25	0.488	1.691
	399.3		79.4	1.48	39.41	0.202	0.713
	400.8		77.9	0.75	20.07	0.075	0.225
	398.0		61.5	[illegible]	20.73	[illegible]	[illegible]
	397.4		63.2	[illegible]	43.14	0.213	[illegible]
	399.3		67.2	2.37	61.09	[illegible]	[illegible]
	[illegible]		71.0	3.25	87.01	[illegible]	[illegible]
29	400.5	0.3167	75.1	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	399.3		78.0	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TABLE B-50

FLOW RESISTANCE OF TDDW WIRE CLOTH

Fluid: Gaseous Helium

Grade Of Wire Cloth	Inlet Press psia	Flow SCFM	SCFM in^2	ACFM in^2	Tare ΔP psid	Net ΔP psid	Temp ^oF
325 X 2300 TDDW	50	1.40	3.78	1.11	0	0.17	78
		2.20	5.93	1.74	0.010	0.26	78
		2.70	7.28	2.14	0.015	0.305	78
		3.22	8.69	2.55	0.0215	0.358	78
		4.55	12.27	3.61	0.030	0.46	78
	400	11.3	30.5	1.12	0.025	0.195	77
		15.0	40.5	1.49	0.045	0.265	77
		22.4	60.4	2.22	0.09	0.43	78
		29.7	80.1	2.94	0.17	0.60	78
		35.0	94.4	3.47	0.19	0.77	78
165 X 1400 TDDW	50	1.40	3.78	1.11	0	0.06	78
		2.20	5.93	1.74	0.010	0.08	78
		2.79	7.28	2.14	0.015	0.10	78
		3.22	8.69	2.55	0.0215	0.118	78
		4.55	12.27	3.61	0.030	0.16	78
	400	11.3	30.5	1.12	0.025	0.062	76
		15.0	40.5	1.49	0.045	0.095	76
		22.4	60.4	2.22	0.09	0.15	73
		29.7	80.1	2.94	0.17	0.19	74
		35.0	94.4	3.47	0.19	0.27	75
80 X 700 TDDW	50	1.40	3.78	1.11	0	0.03	78
		2.20	5.93	1.74	0.010	0.045	78
		2.70	7.28	2.14	0.015	0.055	78
		3.22	8.69	2.55	0.0215	0.068	78
		4.55	12.27	3.61	0.030	0.090	78
	400	11.3	30.5	1.12	0.025	0.045	78
		15.0	40.5	1.49	0.045	0.065	78
		22.4	60.4	2.22	0.09	0.120	78
		29.7	80.1	2.94	0.17	0.180	78
		35.0	94.4	3.47	0.19	0.280	78
30 X 250 TDDW	50	1.40	3.78	1.11	0	0.019	77
		2.20	5.93	1.74	0.010	0.0255	77
		2.70	7.28	2.14	0.015	0.032	77
		3.22	8.69	2.55	0.0215	0.040	77
		4.55	12.27	3.61	0.030	0.057	77
	400	11.3	30.5	1.12	0.025	0.033	78
		15.0	40.5	1.49	0.045	0.050	78
		22.4	60.4	2.22	0.09	0.105	78
		29.7	80.1	2.94	0.17	0.160	78
		35.0	94.4	3.47	0.19	0.272	78

TABLE B-51

FLOW RESISTANCE OF PDSW WIRE CLOTH

Fluid: Gaseous Helium

Grade of Nire Cloth	Inlet Press psia	Flow SCFM	SCFM in^2	ACFM in^2	Tare ΔP psid	Net ΔP psid	Temp ^oF
80 X 400 PDSW	50	1.40	3.78	1.11	0	0.018	79
		2.20	5.93	1.74	0.010	0.020	79
		2.70	7.28	2.14	0.015	0.024	79
		3.22	8.69	2.55	0.0215	0.0265	79
		4.55	12.27	3.61	0.030	0.037	79
	400	11.3	30.5	1.12	0.025	0.014	78
		15.0	40.5	1.49	0.045	0.019	78
		22.4	60.4	2.22	0.09	0.030	78
		29.7	80.1	2.94	0.17	0.028	78
		35.0	94.4	3.47	0.19	0.070	78
30 x 150 PDSW	50	1.40	3.78	1.11	0	0.01	77
		2.20	5.93	1.74	0.010	0.009	77
		2.70	7.28	2.14	0.015	0.01	77
		3.22	8.69	2.55	0.0215	0.011	77
		4.55	12.27	3.61	0.030	0.0145	77
	400	11.3	30.5	1.12	0.025	0.002	78
		15.0	40.5	1.49	0.045	0.002	78
		22.4	60.4	2.22	0.09	0.01	78
		29.7	80.1	2.94	0.17	-0.003	78
		35.0	94.4	3.47	0.19	0.039	78

TABLE B-52

FLOW RESISTANCE OF 325 x 2300 TDDW FLOWING GASEOUS HYDROGEN

Test No.	Inlet Press psia	Area in^2	Temp °F	ACFM/in^2	SCFM/in^2	Tare ΔP psid	Net ΔP psid
51A	51.2	0.3349	80.1	.76	2.59	.004	.060
	50.5		79.2	1.66	5.62	.009	.118
	49.9		77.9	2.47	8.28	.017	.173
	48.6		76.5	3.31	10.81	.028	.228
	48.6		75.2	4.09	13.42	.041	.285
	47.4		74.6	5.09	16.26	.058	.350
	47.4		74.6	4.16	13.29	.040	.289
	48.6		74.8	3.36	11.01	.028	.229
	49.3		75.3	2.47	8.21	.017	.172
	48.6		76.2	1.67	5.48	.009	.119
	48.6		76.7	.84	2.74	.004	.067
52	49.0	0.3349	83.3	.73	2.38	.003	.044
	48.3		80.2	1.64	5.28	.008	.100
	50.2		75.8	2.44	8.25	.017	.153
	47.7		73.2	3.28	10.58	.027	.205
	49.0		70.6	4.00	13.32	.040	.258
	49.0		70.2	4.87	16.24	.058	.309
	49.0		71.9	4.06	13.50	.041	.259
	48.3		73.5	3.27	10.68	.027	.210
	49.6		74.3	2.43	8.14	.017	.156
	48.3		74.8	1.64	5.36	.009	.110
	49.6		72.4	.85	2.85	.004	.063
53	50.2	0.3349	81.9	.83	2.78	.003	.033
	50.9		79.7	1.68	5.71	.007	.089
	51.5		76.9	2.47	8.84	.015	.145
	50.2		75.0	3.29	11.13	.025	.209
	49.6		73.2	4.15	13.94	.039	.272
	50.2		71.6	4.95	16.88	.057	.335
	49.0		71.7	4.12	13.69	.038	.271
	49.6		71.9	3.29	11.07	.025	.208
	50.9		72.2	2.45	8.46	.015	.150
	50.2		73.2	1.67	5.70	.007	.097
	50.2		73.8	.81	2.75	.003	.040
54A	401.0	0.3349	76.8	.71	19.21	.016	.127
	401.6		75.4	1.47	39.90	.038	.276
	398.4		74.7	2.16	58.14	.070	.452
	393.4		74.0	2.98	80.22	.126	.692
	395.3		74.8	3.72	99.30	.187	.921
	395.9		74.5	4.50	120.29	.268	1.236
	395.3		74.7	3.74	99.64	.187	.930
	395.9		74.0	3.02	80.71	.127	.710
	397.2		73.6	2.13	57.23	.068	.445
	397.8		73.3	1.49	40.14	.039	.279
	396.5		73.7	.72	19.26	.016	.102
54D	399.5	0.3349	64.8	.83	22.67	.019	.060
	400.7		64.3	1.57	43.43	.044	.125
	401.4		64.3	2.16	59.70	.074	.181
	404.5		64.6	3.04	84.44	.139	.268
	402.6		65.0	3.86	106.85	.212	.371
	402.6		65.3	4.48	123.85	.282	.466
	398.8		65.3	3.83	104.87	.205	.366
	404.5		65.4	2.99	83.18	.133	.263
	403.9		65.4	2.19	60.67	.076	.178
	403.3		65.4	1.44	39.98	.038	.109
	404.5		65.6	.79	21.96	.018	.052

Test No.	Inlet Press psia	Area in^2	Temp °F	ACFM/in^2	SCFM/in^2	Tare ΔP psid	Net ΔP psid
55A	398.9	0.3349	85.5	.75	19.87	.016	.057
	392.6		83.6	1.51	39.43	.038	.132
	396.4		80.2	2.21	58.52	.072	.203
	393.2		78.3	3.04	80.17	.125	.298
	393.2		77.2	3.81	100.53	.189	.392
	394.5		76.2	4.55	120.66	.268	.515
	395.8		76.7	3.78	100.62	.192	.387
	395.8		77.5	3.05	81.03	.127	.297
	396.4		78.7	2.19	58.06	.070	.199
	397.0		80.0	1.53	40.57	.039	.132
	400.8		82.5	.71	18.97	.016	.051
56A	405.8	0.3349	65.6	.74	20.74	.017	.054
	396.3		64.3	1.56	42.55	.042	.129
	400.7		63.5	2.20	60.86	.077	.187
	399.5		63.0	3.03	83.40	.134	.278
	400.7		62.8	3.83	106.05	.209	.377
	398.8		62.8	4.55	125.20	.287	.492
	402.0		62.8	3.78	104.80	.207	.365
	402.0		63.0	3.05	84.51	.138	.287
	400.1		63.3	2.13	58.71	.072	.177
	400.1		63.7	1.52	41.80	.042	.115
	398.8		64.4	.74	20.37	.017	.045
56	399.9	0.3349	76.3	.79	21.38	.017	.060
	398.6		77.4	1.54	41.18	.027	.125
	399.9		75.8	2.33	62.61	.045	.210
	401.1		71.4	3.12	84.97	.071	.307
	402.4		69.6	3.88	106.37	.104	.409
	399.9		79.6	3.10	82.84	.069	.304
	399.2		76.9	2.33	62.54	.045	.212
	398.0		74.8	1.55	41.70	.027	.127
	401.1		74.6	.79	21.26	.016	.056
54	397.1	0.3349	72.5	.79	21.27	.016	.059
	401.5		69.3	1.55	42.61	.028	.125
	402.2		66.1	2.33	64.24	.046	.206
	403.5		65.2	3.11	86.18	.073	.298
	400.9		64.7	3.88	106.46	.104	.404
	402.8		79.9	3.86	103.85	.100	.400
	401.5		75.7	3.12	84.43	.071	.298
	402.8		72.9	2.35	64.22	.047	.204
	399.0		71.4	1.57	42.66	.028	.123
	402.2		72.8	.74	20.02	.016	.042
55	400.6	0.3349	81.9	.76	20.20	.016	.043
	397.5		83.3	1.50	39.68	.038	.090
	400.0		84.7	2.19	58.05	.070	.136
	400.6		84.6	3.04	80.65	.127	.185
	398.1		84.3	3.78	99.62	.186	.231
	396.8		83.0	4.54	119.75	.264	.291
	400.0		80.0	3.79	101.27	.193	.231
	398.7		76.5	3.04	81.60	.130	.183
	397.5		76.0	2.19	58.54	.071	.135
	397.5		76.4	1.53	40.92	.040	.096
	398.1		79.2	.80	21.35	.018	.047

TABLE B-53

FLOW RESISTANCE OF 165 X 1400 TDDW FLOWING GASEOUS HYDROGEN

Test No.	Inlet Press psia	Area in^2	Temp °F	ACFM/in^2	SCFM/in^2	Tare ΔP psid	Net ΔP psid
	51.2		84.4	.81	2.76	.004	.020
	50.5		84.3	1.65	5.54	.009	.035
	49.9		84.3	2.58	8.52	.018	.054
	50.5		84.1	3.35	11.24	.029	.072
	49.9		83.6	4.28	14.17	.045	.092
45	49.9	0.3349	82.8	5.09	16.88	.063	.113
	48.6		82.8	4.34	14.02	.044	.092
	49.9		82.9	3.35	11.10	.029	.071
	51.2		83.3	2.54	8.62	.019	.053
	51.2		83.8	1.69	5.75	.010	.034
	48.6		84.6	.82	2.63	.004	.018
	52.5		77.6	.82	2.88	.004	.012
	50.5		77.2	1.67	5.66	.009	.032
	49.9		78.4	2.47	8.28	.017	.050
	48.6		78.7	3.32	10.80	.027	.069
	48.6		79.0	4.14	13.49	.041	.091
46	48.0	0.3349	79.4	4.97	15.97	.057	.110
	48.6		79.7	4.14	13.45	.041	.089
	50.5		80.2	3.26	11.02	.028	.069
	50.5		80.7	2.45	8.28	.017	.049
	51.2		81.0	1.65	5.63	.009	.032
	53.1		80.5	.78	2.76	.004	.011
	51.5		62.7	.80	2.85	.004	.018
	49.6		63.0	1.64	5.61	.009	.032
	50.9		63.0	2.37	8.31	.017	.046
	49.6		62.7	3.30	11.30	.030	.062
	50.9		62.7	4.08	14.32	.047	.072
47	49.0	0.3349	62.6	4.98	16.85	.063	.089
	49.0		62.8	4.10	13.87	.043	.075
	49.6		63.1	3.30	11.29	.030	.061
	50.2		63.2	2.36	8.[illegible]	.017	.046
	50.2		63.5	1.63	5.64	.009	.035
	49.6		63.5	.83	2.82	.004	.020
	395.1		80.0	.72	19.14	.016	.017
	395.1		77.8	1.47	38.95	.037	.048
	397.0		74.2	2.20	59.06	.073	.078
	394.5		72.7	3.03	80.96	.126	.123
	390.7		70.9	3.75	99.53	.188	.166
48	397.6	0.3349	70.0	4.50	121.83	.274	.224
	391.4		70.5	3.75	99.88	.189	.162
	395.1		71.4	3.00	80.50	.125	.118
	400.8		72.6	2.15	58.44	.071	.072
	394.5		73.7	1.49	39.81	.038	.045
	397.6		75.9	.72	19.16	.016	.012
	406.4		72.4	.72	19.91	.016	.021
	400.7		71.8	1.44	39.28	.037	.046
	400.1		71.4	2.18	59.15	.073	.075
	399.5		71.1	3.01	81.57	.130	.111
	399.5		70.9	3.75	101.93	.191	.152
50A	396.9	0.3349	70.9	4.56	123.13	.280	.218
	396.3		71.1	3.76	101.32	.193	.152
	398.2		71.2	3.04	82.09	.132	.111
	396.9		71.3	2.20	59.28	.074	.073
	398.8		71.4	1.56	42.13	.042	.045
	397.6		71.6	.80	21.62	.018	.018
	399.2		77.1	.75	20.19	.016	.020
	401.1		76.7	1.56	42.10	.027	.053
	400.5		77.9	2.29	61.50	.044	.091
	400.5		78.3	3.08	82.69	.068	.141
50	398.0	0.3349	78.5	3.88	103.54	.099	.198
	398.6		78.5	3.08	82.37	.067	.191
	399.2		78.3	2.31	61.76	.044	.099
	403.7		78.4	1.55	42.01	.027	.051
	402.4		79.2	.78	21.09	.016	.019
	398.3		63.5	.72	19.80	.016	.028
	400.2		65.6	1.51	41.47	.041	.049
	401.5		66.8	2.15	59.05	.073	.074
	399.6		68.8	3.01	82.02	.131	.115
	400.8		69.9	3.78	103.06	.198	.160
49	397.7	0.3349	69.7	4.48	121.46	.271	.225
	399.0		69.6	3.74	101.67	.194	.165
	396.4		69.1	2.98	80.42	.127	.130
	398.3		67.2	2.15	58.70	.072	.050
	401.5		65.9	1.48	40.63	.039	.046
	400.2		65.4	.74	20.36	.017	.015
	402.6		82.2	.64	17.11	.014	.015
	398.2		80.5	1.57	41.77	.012	.048
	398.2		77.7	2.23	59.57	.075	.077
	396.9		76.2	2.97	79.26	.122	.115
	400.1		74.0	3.71	100.19	.189	.151
49A	398.2	0.3349	73.5	4.47	120.31	.268	.209
	397.6		73.8	3.81	102.37	.198	.162
	397.6		74.5	3.06	82.20	.132	.116
	396.9		75.2	2.15	57.49	.070	.072
	398.2		76.4	1.45	38.71	.036	.043
	403.3		77.5	.68	18.54	.015	.012

TABLE B-54

FLOW RESISTANCE OF 80 x 700 TDDW FLOWING GASEOUS HYDROGEN

Test No.	Inlet Press psia	Area in²	Temp °F	ACFM/in²	SCFM/in²	Tare ΔP psid	Net ΔP psid
39	46.1	0.3349	87.6	2.30	6.99	.013	.031
	50.5		87.4	1.63	5.41	.009	.015
	49.9		87.3	2.50	8.21	.017	.028
	48.0		87.0	3.39	10.72	.027	.043
	47.4		86.6	4.26	13.32	.041	.058
	47.4		85.7	5.09	15.92	.056	.076
	48.6		85.6	4.25	13.68	.042	.058
	49.9		86.1	3.37	11.10	.029	.042
	49.3		86.8	2.54	8.26	.017	.030
	50.5		87.2	1.64	5.48	.009	.017
	50.5		87.6	.64	2.15	.003	.005
40	51.0	0.3349	59.5	.74	2.63	.003	.008
	49.7		60.0	1.61	5.55	.007	.021
	49.1		60.0	2.44	8.29	.015	.032
	47.8		60.0	3.27	10.85	.024	.049
	47.1		60.2	4.04	13.22	.035	.065
	47.8		60.4	4.94	16.37	.054	.080
	47.8		60.6	4.07	13.47	.037	.063
	49.1		60.9	3.26	11.08	.025	.048
	51.0		61.1	2.40	8.46	.015	.034
	50.3		61.4	1.58	5.52	.007	.022
	51.0		61.4	.78	2.75	.003	.011
41	73.8	0.3349	50.9	.66	2.26	.003	.002
	71.9		49.6	1.57	5.27	.008	.011
	68.4		49.6	2.33	7.88	.016	.017
	66.2		49.6	3.14	10.67	.027	.026
	65.8		49.0	3.93	13.20	.040	.036
	66.3		50.2	4.74	16.34	.059	.041
	67.6		50.9	3.89	13.53	.041	.035
	68.7		50.9	3.04	10.54	.027	.029
	69.3		50.9	2.27	7.88	.016	.023
	69.7		50.9	1.45	5.03	.008	.017
	70.3		51.5	.69	2.42	.003	.012
42	396.4	0.3349	81.4	.75	19.72	.016	.016
	397.0		79.2	1.48	39.40	.038	.046
	396.4		75.4	2.19	58.55	.071	.083
	393.9		74.1	3.03	80.59	.125	.135
	394.5		72.6	3.71	99.18	.185	.192
	394.5		72.0	4.34	116.01	.249	.305
	393.9		72.5	3.79	101.03	.193	.195
	396.4		72.9	3.01	30.87	.127	.135
	397.0		74.5	1.48	39.65	.039	.045
	396.4		75.2	1.50	39.95	.039	.046
	400.8		76.3	.72	19.50	.016	.014
43	400.8	0.3349	61.7	.70	19.50	.016	.023
	399.6		62.1	1.51	41.64	.042	.070
	399.6		66.4	2.15	59.00	.072	.122
	399.6		68.0	2.99	81.67	.129	.207
	401.5		68.8	3.78	103.58	.202	.315
	402.1		69.4	4.48	122.81	.277	.456
	397.1		68.9	3.75	101.65	.195	.311
	399.6		68.9	3.01	82.00	.131	.211
	400.2		68.5	2.18	59.47	.074	.120
	400.2		68.0	1.44	39.47	.038	.057
	402.7		67.4	.75	20.61	.017	.015
44	395.3	0.3349	79.4	.76	20.01	.016	.026
	395.3		80.6	1.47	38.83	.037	.073
	397.8		82.6	2.13	56.39	.067	.129
	396.5		83.3	2.97	78.09	.119	.219
	398.4		82.0	3.75	99.49	.188	.326
	397.2		78.8	4.50	119.56	.265	.471
	399.1		77.1	3.74	100.32	.189	.327
	399.7		75.9	3.02	81.38	.128	.225
	397.8		75.4	2.16	57.77	.070	.129
	401.6		74.5	1.51	40.83	.039	.072
	402.5		74.5	.75	20.38	.017	.020

TABLE B-55

FLOW RESISTANCE OF 30 X 250 TDDW FLOWING GASEOUS HYDROGEN

Test No.	Inlet Press psia	Area in2	Temp °F	ACFM/in^2	SCFM/in^2	Tare ΔP psid	Net ΔP psid
33	49.2	0.3349	76.7	.74	2.46	.004	0
	47.9		76.7	1.50	4.82	.007	.004
	47.9		76.6	2.37	7.63	.015	.011
	47.3		76.5	3.17	10.08	.024	.022
	48.6		76.4	3.95	12.90	.038	.030
	49.2		76.1	4.79	15.87	.056	.042
	49.9		76.7	3.93	13.16	.039	.031
	47.9		76.2	3.17	10.22	.025	.023
	48.6		76.2	2.32	7.58	.015	.015
	49.2		76.1	1.53	5.05	.008	.008
	47.9		76.1	.81	2.61	.004	.003
34	49.2	0.3349	77.0	.76	2.50	.004	.006
	49.2		77.0	1.57	5.18	.008	.013
	48.6		76.6	2.39	7.82	.016	.025
	45.9		75.9	3.16	10.60	.027	.037
	49.2		75.4	3.92	13.01	.038	.053
	48.6		74.4	4.81	15.78	.055	.075
	48.6		74.1	3.98	13.08	.039	.053
	49.9		74.4	3.17	10.67	.027	.037
	49.2		74.8	2.35	7.80	.016	.023
	49.2		75.9	1.59	5.27	.008	.014
	50.5		75.4	.76	2.59	.004	.004
35	52.2	0.3349	73.9	.69	2.45	.003	.004
	50.[illegible]		75.4	1.60	5.43	.009	.006
	50.4		76.4	2.36	7.98	.016	.008
	49.0		77.6	3.14	10.31	.025	.012
	48.3		78.0	3.93	12.75	.037	.016
	48.3		78.4	4.81	15.59	.054	.018
	49.6		78.9	3.99	13.24	.040	.013
	49.6		78.9	3.17	10.53	.026	.012
	51.5		79.5	2.37	8.15	.017	.007
	51.5		78.1	1.56	5.38	.009	.005
	51.5		76.4	.77	2.67	.004	.003
33A	48.6	0.3349	83.7	.69	2.22	.003	.006
	47.9		84.0	1.58	5.03	.008	.021
	49.2		84.4	2.37	7.73	.015	.040
	47.9		84.3	3.17	10.06	.024	.060
	49.2		84.1	3.96	12.73	.037	.086
	49.2		83.8	4.77	15.59	.054	.124
	48.6		84.1	3.94	12.71	.037	.089
	48.6		84.2	3.16	10.19	.025	.059
	49.2		84.0	2.37	7.74	.015	.037
	49.2		83.7	1.54	5.02	.008	.018
	51.1		83.3	.74	2.53	.004	.005

Test No.	Inlet Press psia	Area in2	Temp °F	ACFM/in^2	SCFM/in^2	Tare ΔP psid	Net ΔP psid
38	392.8	0.3349	73.1	.77	20.48	.017	.018
	397.2		80.0	1.48	39.37	.038	.057
	399.1		83.6	2.17	57.52	.070	.105
	399.1		74.6	3.01	81.10	.148	.181
	395.9		68.8	3.76	101.62	.194	.268
	397.2		67.0	4.52	123.03	.280	.390
	395.9		66.8	3.76	101.93	.196	.265
	397.2		66.9	3.01	81.80	.131	.179
	399.7		66.9	2.18	59.59	.074	.105
	397.2		66.4	1.47	40.04	.038	.056
	397.2		66.9	.72	19.53	.016	.016
36	402.6	0.3349	78.3	.73	19.80	.016	.007
	400.1		76.6	1.49	40.19	.039	.030
	399.5		75.5	2.21	59.51	.074	.058
	397.6		74.5	3.00	80.55	.127	.094
	400.1		73.8	3.78	102.23	.197	.137
	399.5		73.5	4.57	123.32	.280	.207
	398.2		73.8	3.85	103.50	.202	.142
	400.1		74.0	3.01	81.35	.129	.093
	400.7		74.5	2.08	56.34	.068	.049
	399.5		75.5	1.41	37.93	.036	.025
	402.0		76.1	.75	20.30	.017	.005
37	396.9	0.3349	82.3	.75	19.71	.016	.017
	402.5		81.3	1.48	39.70	.039	.056
	396.9		79.0	2.16	57.42	.069	.108
	396.9		76.9	2.98	79.55	.124	.181
	395.6		75.7	3.71	98.89	.184	.268
	400.7		75.9	4.42	119.24	.262	.376
	397.5		76.3	3.79	101.34	.193	.276
	395.6		77.3	2.98	79.29	.123	.180
	400.0		79.6	2.13	57.00	.068	.101
	396.3		80.8	1.47	38.93	.037	.052
	396.3		82.4	.74	19.59	.016	.012

C-2

TABLE B-56

LIQUID NITROGEN FLOW RESISTANCE TESTS

TARE SPECIMEN

Test No.: 001A   Test Fluid: Liquid Nitrogen
Test Specimen: "Tare" - Specimen diameter = 1.420 inches; Area = 1.584 square inches

"Tare" FlowRate Versus Differential Pressure

Test Specimen Inlet Conditions: Average Flow Rate (GPM)	Average Flow Rate (liter/Min.)	Temperature (^oF)	Temperature (^oK)	Pressure (PSIA)	Pressure (Kg/sq cm)	Average Differential Pressure (PSID)	Average Differential Pressure (Kg/sq cm differential)
0.97	3.67	-315	80.2	53.7	3.77	-0.025	-0.0017
0.97	3.67	-315	80.2	52.5	3.69	-0.026	-0.0018
2.01	7.61	-315	80.2	53.1	3.73	0.010	0.0007
2.03	7.68	-315	80.2	51.9	3.65	0.005	0.0003
2.06	7.80	-314	80.8	51.8	3.64	0.005	0.0003
2.86	10.82	-316	79.7	52.5	3.69	0.052	0.0036
2.86	10.82	-313	81.3	52.1	3.66	0.053	0.0037
2.89	10.94	-314	80.8	51.1	3.59	0.051	0.0036
2.92	11.05	-317	79.1	51.3	3.61	0.051	0.0036
3.92	14.84	-316	79.7	51.5	3.62	0.130	0.0091
3.97	15.03	-314	80.8	50.8	3.57	0.129	0.0091
3.98	15.06	-317	79.1	50.2	3.53	0.130	0.0091
4.04	15.29	-314	80.8	49.6	3.49	0.128	0.0090
4.94	18.70	-316	79.7	50.5	3.55	0.225	0.0158
4.98	18.85	-317	79.1	49.1	3.45	0.226	0.0159
5.00	18.93	-315	80.2	49.2	3.46	0.222	0.0156
5.02	19.00	-315	80.2	48.2	3.39	0.220	0.0155
		AVG -315	AVG 80.2				

Tare delta P = -0.0375199070 + 0.0014516291 (GPM) + 0.0101911594(GPM)^2

TABLE B-57

LIQUID NITROGEN FLOW RESISTANCE TESTS

30 X 160 PDSW

Test No. : 059 Test Fluid: Liquid Nitrogen

Test Specimen: 30 X 160 PDSW Specimen diameter = 1.420 inches; Area = 1.584 square inches

Flow Rate Versus Differential Pressure

Test Specimen Inlet Conditions: Average Flow Rate (GPM)	(Liter/min)	(GPM/in^2)	Temperature (^oF)	(^oK)	Pressure (psia)	(Kg/sq cm)	Differential Pressure: Avg. "Gross" (psid)	"Tare" (psid)	Observed "Net" (psid)	(Kg/sq cm differential)	Predicted* Differential Pressure (PSID)	Differential Pressure Deviation (Observed-Predicted)	Percent Deviation from Predicted
2.05	7.76	1.29	-315	80.2	56.2	3.95	0.063	0.008	0.05	0.003	0.04	+0.01	20.0
2.11	7.99	1.33	-314	80.8	58.8	4.13	0.059	0.011	0.05	0.003	0.04	+0.01	20.0
2.95	11.17	1.86	-315	80.2	56.7	3.99	0.155	0.055	0.10	0.007	0.07	+0.03	42.8
2.99	11.32	1.89	-315	80.2	52.4	3.68	0.151	0.058	0.09	0.006	0.07	+0.02	28.6
3.01	11.39	1.90	-313	81.3	54.1	3.80	0.156	0.059	0.10	0.007	0.08	+0.02	20.0
3.05	11.54	1.92	-315	80.2	58.5	4.11	0.162	0.062	0.10	0.007	0.08	+0.02	20.0
3.07	11.62	1.94	-314	80.8	58.9	4.14	0.174	0.063	0.11	0.008	0.08	+0.03	27.3
3.99	15.10	2.52	-314	80.8	54.9	3.86	0.293	0.130	0.16	0.011	0.13	+0.03	21.4
4.00	15.14	2.52	-313	81.3	51.9	3.65	0.287	0.131	0.16	0.011	0.13	+0.03	21.4
4.04	15.29	2.55	-315	80.2	58.0	4.08	0.291	0.135	0.16	0.011	0.13	+0.03	21.4
4.04	15.29	2.55	-316	79.7	52.2	3.67	0.296	0.135	0.16	0.011	0.13	+0.03	21.4
5.00	18.93	3.16	-316	79.7	57.0	4.01	0.460	0.224	0.24	0.017	0.20	+0.04	19.0
5.08	19.23	3.21	-316	79.7	51.9	3.65	0.476	0.233	0.24	0.017	0.21	+0.03	19.0
5.13	19.42	3.24	-315	80.2	49.3	3.47	0.479	0.238	0.24	0.017	0.21	+0.03	19.0
5.17	19.57	3.26	-315	80.2	53.4	3.75	0.486	0.242	0.24	0.017	0.21	+0.03	19.0
			Avg -315	Avg 80.2									Avg 22.7

* For LN_2 at -315^oF S.G. = 0.789; cp = 0.135

Net Differential Pressure = $0.019Q^2 + 0.004Q$

TABLE B-58

LIQUID NITROGEN FLOW RESISTANCE TESTS

80 X 400 PDSW

Test No. : 060 Test Fluid : Liquid Nitrogen

Test Specimen: 80 X 400 PDSW Specimen diameter = 1.420 inches; Area = 1.584 square inches

Flow Rate Versus Differential Pressure

Test Specimen Inlet Conditions							Differential Pressure				Predicted* Differential Pressure	Differential Pressure Deviation	Percent Deviation from Predicted
Average Flow Rate			Temperature		Pressure		Avg. "Gross"	"Tare"	Observed "Net"				
(GPM)	(Liter/min)	(GPM/in^2)	(°F)	(°K)	(psia)	(Kg/sq cm)	(psid)	(psid)	(psid)	(Kg/sq cm differential)	(PSID)	(Observed-Predicted)	
2.03	7.68	1.28	-318	78.5	51.7	3.63	0.059	0.007	0.05	0.003	0.05	0	0
2.03	7.68	1.28	-318	78.5	50.8	3.57	0.054	0.007	0.05	0.003	0.05	0	0
2.04	7.72	1.29	-317	79.1	52.8	3.71	0.069	0.008	0.06	0.004	0.05	+0.01	16.
2.96	11.20	1.87	-319	78.0	52.3	3.68	0.152	0.056	0.10	0.007	0.09	+0.01	10.
2.98	11.28	1.88	-317	79.1	51.9	3.65	0.169	0.057	0.11	0.008	0.09	+0.02	18.
3.00	11.35	1.89	-319	78.0	51.2	3.60	0.160	0.058	0.10	0.007	0.09	+0.01	10.
3.01	11.39	1.90	-319	78.0	50.1	3.52	0.157	0.059	0.10	0.007	0.09	+0.01	10.
3.01	11.39	1.90	-318	78.5	49.8	3.50	0.162	0.059	0.10	0.007	0.09	+0.01	10.
3.93	14.88	2.48	-317	79.1	50.9	3.58	0.300	0.125	0.17	0.012	0.15	+0.02	11.
3.93	14.88	2.48	-318	78.5	48.8	3.43	0.288	0.125	0.16	0.011	0.15	+0.01	6.
3.98	15.06	2.51	-319	78.0	50.3	3.54	0.300	0.130	0.17	0.012	0.16	+0.01	5.
4.01	15.18	2.53	-319	78.0	51.4	3.61	0.300	0.132	0.17	0.012	0.16	+0.01	5.
4.02	15.22	2.54	-319	78.0	49.7	3.49	0.307	0.133	0.17	0.012	0.16	+0.01	5.
4.05	15.33	2.56	-319	78.0	49.2	3.46	0.305	0.135	0.17	0.012	0.16	+0.01	5.
5.01	18.96	3.16	-319	78.0	50.5	3.55	0.480	0.225	0.25	0.017	0.24	+0.01	4.
5.01	18.96	3.16	-319	78.0	47.4	3.33	0.474	0.225	0.25	0.017	0.24	+0.01	4.
5.02	19.00	3.17	-319	78.0	49.4	3.47	0.491	0.226	0.26	0.018	0.24	+0.02	7.
5.04	19.08	3.18	-319	48.0	49.2	3.46	0.489	0.229	0.26	0.018	0.24	+0.02	7.
5.08	19.23	3.21	-319	78.0	48.3	3.39	0.494	0.233	0.26	0.018	0.25	+0.01	3.
5.09	19.27	3.21	-319	78.0	48.0	3.37	0.492	0.234	0.26	0.018	0.25	+0.01	3.
		Avg	-318	Avg 78.5									Avg 7.

*For LN_2 at -318 °F - S. G. = 0.796; cp = 0.147

Net Differential Pressure = $0.021Q^2 + 0.010Q$

TABLE B-59
LIQUID NITROGEN FLOW RESISTANCE TESTS
2 X 120 X 650 PDSW

Test No. : 061 Test Fluid : Liquid Nitrogen
Test Specimen: 2 X 120 X 650 PDSW Specimen diameter = 1.420 inches; Area = 1.584 square inches

Flow Rate Versus Differential Pressure

Test Specimen Inlet Conditions: Average Flow Rate (GPM)	(Liter/min)	(GPM/in²)	Temperature (°F)	(°K)	Pressure (psia)	(Kg/sq cm)	Differential Pressure: Avg. "Gross" (psid)	"Tare" (psid)	Observed "Net" (psid)	(Kg/sq cm differential)	Predicted* Differential Pressure (PSID)	Differential Pressure Deviation (Observed-Predicted)	Percent Deviatio from Predicte
2.03	7.68	1.28	-316	79.7	52.4	3.68	0.096	0.007	0.09	0.006	0.08	+0.01	11.1
2.03	7.68	1.28	-316	79.7	51.3	3.61	0.089	0.007	0.08	0.006	0.08	0.00	0
2.97	11.24	1.87	-317	79.1	51.9	3.65	0.215	0.057	0.16	0.011	0.16	0.00	0
2.97	11.24	1.87	-317	79.1	50.9	3.58	0.208	0.057	0.15	0.010	0.16	-0.01	6.7
3.03	11.47	1.91	-317	79.1	51.5	3.62	0.221	0.060	0.16	0.011	0.16	-0.00	0
3.04	11.51	1.92	-317	79.1	50.3	3.54	0.219	0.061	0.16	0.011	0.17	-0.01	6.2
3.06	11.58	1.93	-317	79.1	49.4	3.47	0.215	0.062	0.15	0.010	0.17	-0.02	13.3
3.90	14.76	2.46	-316	79.7	49.5	3.48	0.365	0.123	0.24	0.017	0.26	-0.02	8.3
3.96	14.99	2.50	-317	79.1	49.0	3.44	0.367	0.128	0.24	0.017	0.27	-0.03	12.5
4.00	15.14	2.52	-316	79.7	48.7	3.42	0.376	0.131	0.24	0.017	0.27	-0.03	12.5
4.00	15.14	2.52	-316	79.7	50.6	3.56	0.389	0.131	0.26	0.018	0.27	-0.01	3.8
4.02	15.22	2.54	-318	78.5	50.0	3.51	0.389	0.133	0.26	0.018	0.28	-0.02	7.7
4.02	15.22	2.54	-318	78.5	51.5	3.62	0.392	0.133	0.26	0.018	0.28	-0.02	7.7
5.02	10.00	3.17	-318	78.5	50.9	3.58	0.606	0.226	0.38	0.027	0.42	-0.04	10.5
5.06	19.15	3.19	-317	79.1	48.1	3.38	0.599	0.231	0.37	0.026	0.42	-0.05	13.5
5.06	19.15	3.19	-318	78.5	47.8	3.36	0.592	0.231	0.36	0.025	0.42	-0.06	16.6
5.07	19.19	3.20	-317	79.1	49.3	3.47	0.614	0.232	0.38	0.027	0.43	-0.05	13.1
		Avg	-317	Avg 79.1								Avg	8.4

* For LN_2 at -317°F - $S_2G.$ = 0.793; cp = 0.143
Net Differential Pressure = $0.036Q^2 + 0.018Q$

TABLE B-60

LIQUID NITROGEN FLOW RESISTANCE TESTS

30 X 250 TDDW

Test No. : 002 Test Fluid: Liquid Nitrogen

Test Specimen : 30 X 250 TDDW Specimen diameter = 1.420 inches; Area = 1.584 square inches

Flow Rate Versus Differential Pressure

Test Specimen Inlet Conditions: Average Flow Rate (GPM)	Average Flow Rate (Liter/min)	(GPM/in^2)	Temperature (^oF)	Temperature (^oK)	Pressure (psia)	Pressure (Kg/sq cm)	Differential Pressure: Avg. "Gross" (psid)	"Tare" (psid)	Observed "Net" (psid)	Observed "Net" (Kg/sq cm differential)	Predicted* Differential Pressure (PSID)	Differential Pressure Deviation (Observed-Predicted	Percent Deviation from Predicted
0.95	3.60	0.60	-309	83.5	57.1	4.01	0.027	-0.027	0.05	0.003	0.05	0	0
0.97	3.67	0.61	-310	83.0	58.5	4.11	0.041	-0.026	0.07	0.005	0.05	+0.02	28.6
1.97	7.46	1.24	-313	81.3	56.9	4.00	0.178	0.005	0.17	0.012	0.21	-0.04	23.5
2.02	7.65	1.27	-312	81.8	53.3	3.75	0.203	0.007	0.20	0.014	0.22	-0.02	10.0
2.04	7.72	1.29	-313	81.3	60.5	4.25	0.204	0.008	0.20	0.014	0.23	-0.03	15.0
2.05	7.76	1.29	-313	81.3	53.9	3.79	0.209	0.008	0.20	0.014	0.23	-0.03	15.0
2.07	7.83	1.31	-312	81.8	57.4	4.03	0.215	0.009	0.21	0.015	0.24	-0.03	14.3
2.92	11.05	1.84	-314	80.8	56.7	3.99	0.456	0.054	0.40	0.028	0.46	-0.06	15.0
2.92	11.05	1.84	-315	80.2	57.5	4.04	0.479	0.054	0.42	0.029	0.46	-0.04	9.5
2.95	11.17	1.86	-314	80.8	53.4	3.75	0.474	0.055	0.42	0.029	0.47	-0.05	11.9
2.99	11.32	1.89	-313	81.3	55.9	3.93	0.498	0.058	0.44	0.030	0.48	+0.04	9.1
2.99	11.32	1.89	-315	80.2	50.6	3.56	0.485	0.058	0.43	0.030	0.48	+0.05	11.6
3.01	11.39	1.90	-315	80.2	56.4	3.96	0.499	0.059	0.44	0.030	0.49	+0.05	11.4
3.96	14.99	2.50	-314	80.8	49.0	3.44	0.843	0.128	0.71	0.050	0.84	-0.13	18.3
3.99	15.10	2.52	-315	80.2	51.6	3.63	0.877	0.130	0.75	0.053	0.85	-0.10	13.3
4.01	15.18	2.53	-315	80.2	55.3	3.89	0.904	0.132	0.77	0.054	0.86	-0.09	11.7
4.01	15.18	2.53	-315	80.2	53.5	3.76	0.894	0.132	0.76	0.053	0.86	-0.10	13.1
4.02	15.22	2.54	-314	80.8	56.3	3.96	0.899	0.133	0.77	0.054	0.86	-0.09	11.7
4.92	18.62	3.11	-315	80.2	55.2	3.88	1.456	0.216	1.24	0.087	1.29	-0.05	16.0
5.01	18.96	3.16	-315	80.2	51.2	3.60	1.382	0.225	1.16	0.081	1.33	-0.17	14.6
5.02	19.00	3.17	-316	79.7	48.7	3.42	1.354	0.226	1.13	0.079	1.34	-0.21	18.6
		Avg	-314	Avg 80.8								Avg	13.9

* For LN_2 at -314^oF - S.G. = 0.786; cp = 0.131

Net Differential Pressure = $0.13Q^2 + 0.01Q$

TABLE B-61
LIQUID NITROGEN FLOW RESISTANCE TESTS
165 X 1400 TDDW

Test No. : 006 Test Fluid: Liquid Nitrogen
Test Specimen: 165 X 1400 TDDW Specimen diameter = 1.420 inches; Area = 1.584 square inches

Flow Rate Versus Differential Pressure

Test Specimen Inlet Conditions: Average Flow Rate (GPM)	Average Flow Rate (Liter/min)	Average Flow Rate (GPM/in^2)	Temperature (^oF)	Temperature (^oK)	Pressure (psia)	Pressure (Kg/sq cm)	Differential Pressure: Avg. "Gross" (psid)	"Tare" (psid)	Observed "Net" (psid)	Observed "Net" (Kg/sq cm differential)	Predicted* Differential Pressure (PSID)	Differential Pressure Deviation (Observed-Predicted)	Percent Deviation from Predicted
1.96	7.42	1.24	-305	85.8	56.0	3.94	0.189	0.004	0.18	0.013	0.18	0	0.0
1.96	7.42	1.24	-306	85.2	54.4	3.82	0.181	0.004	0.18	0.013	0.18	0	0.0
1.99	7.53	1.25	-312	81.9	55.0	3.87	0.182	0.006	0.18	0.013	0.18	0	0.0
2.07	7.83	1.31	-307	84.7	53.1	3.73	0.202	0.009	0.19	0.013	0.20	-0.01	5.3
2.95	11.17	1.86	-314	80.8	54.3	3.82	0.419	0.055	0.36	0.025	0.35	+0.01	2.8
2.98	11.28	1.88	-306	85.2	54.7	3.84	0.452	0.057	0.39	0.027	0.36	+0.03	7.7
2.99	11.32	1.89	-312	81.9	55.4	3.89	0.408	0.058	0.35	0.025	0.36	-0.01	2.8
3.01	11.39	1.90	-314	80.8	52.0	3.65	0.424	0.059	0.36	0.025	0.37	-0.01	2.8
3.02	11.43	1.91	-313	81.3	52.0	3.65	0.433	0.060	0.37	0.026	0.37	0	0.0
3.02	11.43	1.91	-304	86.3	53.3	3.75	0.437	0.060	0.38	0.027	0.37	+0.01	2.6
3.03	11.47	1.91	-312	81.9	52.7	3.70	0.439	0.060	0.38	0.027	0.37	+0.01	2.6
3.93	14.88	2.48	-308	84.1	53.4	3.75	0.768	0.125	0.64	0.045	0.58	+0.06	9.4
3.96	14.99	2.50	-314	80.8	54.6	3.84	0.684	0.128	0.56	0.039	0.59	-0.03	5.3
4.01	15.18	2.53	-315	80.2	51.4	3.61	0.757	0.132	0.62	0.043	0.60	+0.02	3.2
4.03	15.25	2.54	-314	80.8	52.6	3.70	0.783	0.134	0.65	0.046	0.60	+0.05	7.7
4.06	15.37	2.56	-315	80.2	50.2	3.53	0.777	0.136	0.64	0.045	0.61	+0.03	4.7
4.07	15.41	2.57	-309	83.5	51.9	3.65	0.689	0.137	0.55	0.039	0.62	-0.07	12.7
5.00	18.93	3.16	-314	80.8	49.5	3.48	1.164	0.224	0.94	0.066	0.89	+0.05	5.3
5.05	19.11	3.19	-313	81.3	50.7	3.56	1.207	0.230	0.98	0.069	0.90	+0.08	8.2
5.06	19.15	3.19	-315	80.2	48.0	3.37	1.191	0.231	0.96	0.067	0.90	+0.06	6.2
5.07	19.19	3.20	-311	82.4	49.7	3.49	1.079	0.232	0.85	0.060	0.91	-0.06	7.0
5.07	19.19	3.20	-315	80.2	52.7	3.70	1.150	0.232	0.92	0.065	0.91	+0.01	1.1
			Avg -311	Avg 82.4									Avg 4.4

* For LN_2 at -311^oF ---- S. G. = 0.779; CP - 0.120
Net Differential Pressure = $0.07Q^2 + 0.06Q$

TABLE B-62

LIQUID NITROGEN FLOW RESISTANCE TESTS

80 X 700 TDDW

Test No. : 004 Test Fluid : Liquid Nitrogen

Test Specimen: 80 X 700 TDDW Specimen diameter = 1.420 inches; Area = 1.584 square inches

Flow Rate Versus Differential Pressure

Average Flow Rate (GPM)	Average Flow Rate (Liter/min)	Average Flow Rate (GPM/in²)	Temperature (°F)	Temperature (°K)	Pressure (psia)	Pressure (Kg/sq cm)	Avg. "Gross" (psid)	"Tare" (psid)	Observed "Net" (psid)	Observed "Net" (Kg/sq cm differential)	Predicted* Differential Pressure (PSID)	Differential Pressure Deviation (Observed-Predicted)	Percent Deviation from Predicted
0.96	3.63	0.61	-305	85.8	50.8	3.57	0.030	-0.027	0.06	0.004	0.05	-0.01	20.0
2.05	7.76	1.29	-307	84.7	50.4	3.54	0.224	-0.008	0.22	0.015	0.21	+0.01	4.8
2.06	7.80	1.30	-308	84.1	48.8	3.43	0.212	0.009	0.20	0.014	0.21	-0.01	4.8
2.07	7.83	1.31	-306	85.2	51.8	3.64	0.238	0.009	0.23	0.016	0.21	+0.02	9.5
2.09	7.91	1.32	-302	87.4	50.1	3.52	0.231	0.010	0.22	0.015	0.22	0	0.0
3.03	11.47	1.91	-307	84.7	51.4	3.61	0.516	0.060	0.46	0.032	0.44	+0.02	4.5
3.04	11.51	1.92	-310	83.0	49.8	3.50	0.515	0.061	0.45	0.032	0.44	+0.01	2.3
3.07	11.62	1.94	-310	83.0	48.2	3.39	0.501	0.063	0.44	0.031	0.45	-0.01	2.2
3.07	11.62	1.94	-306	85.2	50.8	3.57	0.529	0.063	0.47	0.033	0.45	+0.02	4.4
3.09	11.70	1.95	-303	86.9	49.2	3.46	0.531	0.064	0.47	0.033	0.46	+0.01	2.2
3.98	15.06	2.51	-310	83.0	49.1	3.45	0.853	0.130	0.72	0.051	0.74	+0.02	2.7
4.01	15.18	2.53	-309	83.5	50.9	3.58	0.844	0.132	0.71	0.050	0.75	-0.04	5.3
4.02	15.22	2.54	-309	83.5	47.7	3.36	0.843	0.133	0.71	0.050	0.76	-0.05	6.6
4.04	15.29	2.55	-307	84.7	48.2	3.39	0.880	0.135	0.74	0.052	0.77	-0.03	3.9
4.06	15.37	2.56	-309	83.5	49.7	3.49	0.888	0.136	0.75	0.053	0.77	-0.02	2.6
4.12	15.59	2.60	-309	83.5	47.0	3.30	0.889	0.141	0.75	0.053	0.79	-0.04	5.1
5.04	19.08	3.18	-309	83.5	48.7	3.42	1.335	0.229	1.11	0.078	1.17	-0.06	5.1
5.07	19.19	3.20	-309	83.5	48.3	3.39	1.346	0.231	1.11	0.078	1.19	-0.08	6.7
5.07	19.19	3.20	-309	83.5	45.8	3.22	1.318	0.232	1.09	0.077	1.19	-0.10	8.4
5.08	19.23	3.21	-308	84.1	46.9	3.30	1.354	0.233	1.12	0.079	1.20	-0.08	6.7
5.11	19.34	3.23	-309	83.5	46.7	3.28	1.359	0.236	1.12	0.079	1.21	-0.09	7.4
5.26	19.91	3.32	-308	84.1	50.0	3.51	1.445	0.252	1.19	0.084	1.28	-0.09	7.0
			Avg -308	Avg 84.1								Avg	5.5

* For LN_2 at -308°F S.G. = 0.772; cp = 0.110

Net Differential Pressure = $0.11Q^2 + 0.02Q$

TABLE B-63

LIQUID NITROGEN FLOW RESISTANCE TESTS

325 X 2300 TDDW

Test No. : 008;010 Test Fluid: Liquid Nitrogen

Test Specimen: 325 X 2300 TDDW Specimen diameter = 1.420 inches; Area = 1.584 square inches

Flow Rate Versus Differential Pressure

Test Sp…men Inlet Conditions							Differential Pressure						
Average Flow Rate			Temperature		Pressure		Avg. "Gross"	"Tare"	Observed "Net"		Predicted* Differential Pressure	Differential Pressure Deviation	Percent Deviatio… from Predicte…
(GPM)	(Liter/min)	(GPM/in²)	(°F)	(°K)	(psia)	(Kg/sq cm)	(psid)	(psid)	(psid)	(Kg/sq cm differential)	(PSID)	(Observed-Predicted)	
0.91	3.44	0.57	-310	83.0	49.6	3.49	0.146	-0.028	0.17	0.012	0.16	+0.01	5.9
0.92	3.48	0.58	-313	81.3	54.7	3.84	0.153	-0.027	0.18	0.013	0.16	+0.02	11.1
2.03	7.68	1.28	-313	81.3	49.2	3.46	0.567	0.007	0.56	0.039	0.49	+0.07	12.5
2.99	11.32	1.89	-315	80.2	48.7	3.42	1.042	0.058	0.98	0.069	0.89	+0.09	9.2
3.95	14.95	2.49	-315	80.2	47.9	3.37	1.643	0.127	1.52	0.107	1.40	+0.12	7.9
3.95	14.95	2.49	-316	79.7	41.2	2.90	1.484	0.127	1.36	0.096	1.40	-0.04	2.9
3.95	14.95	2.49	-316	79.7	39.9	2.80	1.547	0.127	1.42	0.100	1.40	+0.02	1.4
3.99	15.10	2.52	-314	80.8	53.3	3.75	1.602	0.130	1.47	0.103	1.43	+0.04	2.7
4.95	18.74	3.12	-317	79.1	40.5	2.85	2.329	0.219	2.11	0.148	2.05	+0.06	2.8
5.05	19.11	3.19	-312	81.9	52.4	3.68	2.495	0.230	2.26	0.159	2.13	+0.13	5.7
5.05	19.11	3.19	-315	80.2	47.1	3.31	2.467	0.230	2.34	0.164	2.13	+0.21	9.0
5.05	19.11	3.19	-315	80.2	46.8	3.29	2.459	0.230	2.30	0.162	2.13	+0.17	7.4
5.05	19.11	3.19	-311	82.4	46.0	3.23	2.596	0.230	2.37	0.167	2.13	+0.24	10.1
			Avg -314	Avg 80.8									Avg 6.8

* For LN_2 at -314°F - S.G. = 0.786; cp = 0.131
Net Differential Pressure = $0.15Q^2 + 0.19Q$

TABLE B-64

"TARE" FLOW RATE VERSUS DIFFERENTIAL PRESSURE

Test Number: 012   Test Fluid: Liquid Oxygen
Test Specimen: "Tare" - Specimen Diameter = 3.607 cm. (1.420 inches); Area = 10.219 sq.cm. (1.584 square inches)

TEST SPECIMEN INLET CONDITIONS						AVERAGE DIFFERENTIAL PRESSURE	
Average Flow Rate		Temperature		Pressure			
(Liters/min/sq.cm.)	(GPM/in²)	(°K)	(°F)	Kg/sq.cm)	(psia)	Kg/sq.cm. Differential	(psid)
1.39	2.37	92.0	-294	3.87	55.1	0.0126	0.180
1.40	2.39	91.5	-295	3.92	55.7	0.0135	0.192
1.68	2.87	92.0	-294	3.73	53.1	0.0188	0.268
1.68	2.87	91.5	-295	4.00	56.9	0.0189	0.269
1.71	2.92	92.0	-294	3.87	55.1	0.0197	0.280
1.78	3.04	92.0	-294	3.76	53.5	0.0215	0.306
1.96	3.34	91.5	-295	3.77	53.6	0.0257	0.366
1.98	3.37	92.0	-294	3.56	50.7	0.0264	0.376
2.01	3.42	92.0	-294	3.63	51.7	0.0273	0.389
2.19	3.73	90.9	-296	3.62	51.5	0.0326	0.464
2.22	3.78	91.5	-295	3.70	52.6	0.0330	0.470
2.25	3.84	91.5	-295	3.39	48.2	0.0347	0.493
2.35	4.02	91.5	-295	3.43	48.8	0.0380	0.541
2.62	4.46	90.9	-296	3.10	44.1	0.0459	0.653
2.64	4.51	90.9	-296	3.59	51.1	0.0472	0.671
2.70	4.61	90.9	-296	3.20	45.6	0.0498	0.708
2.79	4.75	90.9	-296	2.92	41.5	0.0519	0.739
2.98	5.08	90.9	-296	3.48	49.5	0.0599	0.852
3.01	5.14	90.9	-296	3.43	48.8	0.0615	0.875
	Average	91.5	-295				

Differential Pressure (PSID) = $-0.0240998484 + 0.0127195544\,(\mathrm{GPM/in^2}) + 0.0314471756\,(\mathrm{GPM/in^2})^2$

TABLE B-65

FLOW RATE VERSUS DIFFERENTIAL PRESSURE

Test No: 013 Test Fluid: LO_2 Specimen diameter: 3.607 cm.(1.420 in.); Area = 10.219 sq.cm. (1.584 sq.in.)
Test Specimen: 30 x 160 PDSW

TEST SPECIMEN INLET CONDITIONS							DIFFERENTIAL PRESSURE			
Average Flow Rate			Temperature		Pressure		Avg. "Gross"	"Tare"	Observed "Net"	
(GPM)	(Liters/min/sq.cm.)	(GPM/in²)	(°F)	(°K)	(psia)	(Kg/sq.cm.)	(psid)	(psid)	(psid)	(Kg/sq.cm.) differential
2.08	0.77	1.31	-293	92.6	45.4	3.19	0.115	0.047	0.07	0.005
2.10	0.78	1.32	-292	93.2	50.9	3.58	0.125	0.048	0.08	0.006
2.88	1.07	1.82	-292	93.2	45.9	3.23	0.213	0.104	0.11	0.008
3.00	1.11	1.89	-294	92.0	43.8	3.08	0.249	0.113	0.14	0.010
3.04	1.13	1.92	-294	92.0	49.2	3.46	0.246	0.117	0.13	0.009
3.09	1.14	1.95	-294	92.0	45.4	3.19	0.259	0.121	0.14	0.010
3.95	1.46	2.49	-295	91.5	41.7	2.93	0.423	0.203	0.22	0.015
4.06	1.50	2.56	-295	91.5	47.2	3.32	0.440	0.215	0.22	0.015
4.11	1.52	2.59	-293	92.6	41.2	2.90	0.437	0.220	0.22	0.015
4.12	1.53	2.60	-293	92.6	44.8	3.15	0.411	0.222	0.19	0.013
5.09	1.88	3.21	-294	92.0	40.6	2.85	0.688	0.341	0.35	0.025
5.12	1.90	3.23	-295	91.5	44.9	3.16	0.674	0.346	0.33	0.023
5.14	1.90	3.24	-295	91.5	38.7	2.72	0.703	0.348	0.35	0.025
5.24	1.94	3.31	-294	92.0	43.6	3.06	0.694	0.363	0.33	0.023
5.69	2.11	3.59	-296	90.9	41.2	2.90	0.843	0.428	0.41	0.029
5.99	2.22	3.78	-296	90.9	42.8	3.01	0.936	0.474	0.46	0.032
6.07	2.24	3.83	-295	91.5	39.6	2.78	0.885	0.487	0.40	0.028
6.34	2.35	4.00	-295	91.5	42.0	2.95	1.018	0.531	0.49	0.034
6.82	2.53	4.30	-296	90.9	38.8	2.73	1.155	0.613	0.54	0.038
7.06	2.61	4.46	-296	90.9	39.9	2.80	1.238	0.659	0.58	0.041
			Av. -294	Av. 92.0						

Observed Differential Pressure = $0.024Q^2 + 0.024Q$ $\overline{X} = 0.01$ $\sigma = 0.02$
LO_2 Temp = -294°F; S.G. = 1.13; cp = 0.186

TABLE B-66

FLOW RATE VERSUS DIFFERENTIAL PRESSURE

Test No: 014 Test Fluid: LO_2 Specimen diameter: 3.607 cm. (1.420 in.); Area = 10.219 sq.cm. (1.584 sq.in.)
Test Specimen: 90 x 400 PDSW

TEST SPECIMEN INLET CONDITIONS							DIFFERENTIAL PRESSURE			
Average Flow Rate			Temperature		Pressure		Avg. "Gross"	"Taro"	Observed "Net"	
(GPM)	(Liters/min/sq.cm)	(GPM/in²)	(°F)	(°K)	(psia)	(kg/sq.cm)	(psid)	(psid)	(psid)	(Kg/sq.cm. differential
2.23	0.83	1.41	-295	91.5	65.5	4.61	0.102	0.056	0.05	0.004
3.41	0.89	1.52	-296	90.9	74.2	5.22	0.146	0.068	0.08	0.006
2.94	1.09	1.86	-296	90.9	65.6	4.61	0.212	0.108	0.10	0.007
3.06	1.13	1.93	-295	91.5	62.6	4.40	0.213	0.117	0.10	0.007
3.08	1.14	1.94	-294	92.0	71.7	5.04	0.247	0.119	0.13	0.009
3.09	1.14	1.95	-296	90.9	67.9	4.77	0.240	0.120	0.12	0.008
3.98	1.47	2.51	-295	91.5	68.6	4.82	0.410	0.206	0.20	0.014
4.12	1.53	2.60	-295	91.5	59.3	4.17	0.400	0.221	0.18	0.013
4.15	1.54	2.62	-297	90.4	67.7	4.76	0.442	0.225	0.22	0.015
4.29	1.58	2.71	-297	90.4	63.3	4.45	0.474	0.241	0.23	0.016
4.79	1.77	3.02	-296	90.9	65.5	4.61	0.590	0.301	0.29	0.020
4.89	1.81	3.09	-297	90.4	67.8	4.77	0.626	0.315	0.31	0.022
4.94	1.83	3.12	-297	90.4	60.1	4.22	0.579	0.322	0.26	0.018
5.25	1.94	3.31	-297	90.4	60.4	4.25	0.701	0.362	0.34	0.024
5.87	2.17	3.71	-297	90.4	67.3	4.73	0.892	0.456	0.44	0.031
5.98	2.22	3.78	-297	90.4	59.8	4.20	0.911	0.473	0.44	0.031
6.01	2.23	3.79	-297	90.4	61.9	4.35	0.898	0.476	0.42	0.030
6.40	2.37	4.04	-297	90.4	54.6	3.84	0.987	0.540	0.45	0.032
6.69	2.48	4.22	-298	89.8	57.0	4.01	1.178	0.590	0.53	0.037
6.76	2.50	4.27	-298	89.8	58.3	4.10	1.129	0.603	0.53	0.037
7.02	2.60	4.43	-298	89.8	70.3	4.94	1.242	0.649	0.59	0.041
7.11	2.63	4.49	-298	89.8	63.2	4.44	1.254	0.667	0.59	0.041
7.11	2.63	4.49	-298	89.8	48.7	3.42	1.273	0.667	0.61	0.043
		Av.=	-297	90.4						

Observed Differential Pressure (PSID) = $0.029Q^2 + 0.04Q$ $\bar{X} = 0.01$; $\sigma = 0.02$
LO_2 Temp = -297°F; S.G. = 1.14; cp = 0.194

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

TABLE B-67

Test No.: 015 Test Fluid: LO_2
Test Specimen: 2 X 120 X 650 PDSW Specimen diameter: 3.607 cm. (1.420 in.); Area = 10.219 sq.cm. (1.584 sq.in.)

Flow Rate Versus Differential Pressure

Test Specimen Inlet Conditions							Differential Pressure			
Average Flow Rate			Temperature		Pressure		Avg. "Gross"	"Tare"	Observed "Net"	
(GPM)	(Liters/min/sq.cm.)	(GPM/in2)	(°F)	(°K)	(psia)	(Kg/sq.cm.)	(psid)	(psid)	(psid)	(Kg/sq.cm. differential
2.12	0.78	1.34	-292	93.2	57.2	4.02	0.178	0.049	0.13	0.009
2.14	0.79	1.35	-292	93.2	56.0	3.94	0.175	0.050	0.13	0.009
2.17	0.80	1.37	-293	92.6	59.6	4.19	0.193	0.052	0.14	0.010
2.92	1.08	1.84	-293	92.6	56.6	3.98	0.345	0.106	0.24	0.017
2.93	1.09	1.85	-290	94.3	54.6	3.84	0.338	0.107	0.23	0.016
2.96	1.10	1.87	-293	92.6	55.3	3.89	0.351	0.110	0.24	0.017
3.14	1.16	1.98	-295	91.5	58.2	4.09	0.389	0.124	0.26	0.018
4.01	1.48	2.53	-294	92.0	54.3	3.81	0.630	0.209	0.42	0.029
4.14	1.53	2.61	-295	91.5	55.2	3.88	0.677	0.223	0.45	0.032
4.15	1.54	2.62	-294	92.0	55.2	3.88	0.681	0.225	0.46	0.032
4.16	1.54	2.63	-291	93.7	52.3	3.68	0.665	0.227	0.44	0.031
4.99	1.85	3.15	-295	91.5	54.6	3.84	0.953	0.328	0.62	0.043
5.02	1.86	3.17	-294	92.0	51.3	3.61	0.952	0.332	0.62	0.043
5.05	1.87	3.19	-295	91.5	53.6	3.77	0.980	0.336	0.64	0.045
5.20	1.93	3.28	-292	93.2	45.8	3.50	1.014	0.356	0.66	0.046
5.89	2.19	3.72	-295	91.5	51.5	3.62	1.310	0.458	0.85	0.060
5.97	2.21	3.76	-293	92.6	47.6	3.35	1.316	0.468	0.85	0.060
6.00	2.22	3.79	-295	91.5	49.8	3.50	1.341	0.476	0.87	0.061
6.12	2.27	3.86	-295	91.5	52.7	3.70	1.399	0.493	0.91	0.064
6.98	2.59	4.41	-296	90.9	48.8	3.43	1.805	0.644	1.16	0.081
7.27	2.69	4.59	-294	92.0	50.4	3.54	1.949	0.697	1.25	0.088
7.33	2.71	4.63	-294	92.0	47.2	3.32	1.979	0.709	1.27	0.089
			Avg = -294	92.0						

Observed Differential Pressure (PSID) = $0.053Q^2 + 0.030Q$ $\bar{X} = 0.01$; $\sigma = 0.01$
LO_2 Temp = 294°F; S.G. = 1.13; cp = 0.186

TABLE B-68

Test No.: 016 Test Fluid: LO_2
Test Specimen: 30 X 250 TDDW Specimen diameter: 3.607 cm.(1.420 in.); Area = 10.219 sq.cm. (1.584 sq.in.)

Flow Rate Versus Differential Pressure

Test Specimen Inlet Conditions: Average Flow Rate			Temperature		Pressure		Differential Pressure		Observed "Net"	
(GPM)	(Liters/min/sq.cm.)	(GPM/in2)	(°F)	(°K)	(psia)	(Kg/sq.cm.)	Avg. "Gross" (psid)	"Tare" (psid)	(psid)	(Kg/sq.cm. differential
2.29	0.85	1.44	-294	92.0	66.5	4.67	0.374	0.059	0.32	0.022
2.45	0.91	1.55	-294	92.0	62.4	4.39	0.463	0.071	0.39	0.027
3.06	1.13	1.93	-295	91.5	62.5	4.39	0.703	0.118	0.59	0.041
3.11	1.15	1.96	-293	92.6	66.4	4.67	0.681	0.122	0.56	0.039
3.15	1.17	1.99	-295	91.5	67.4	4.74	0.724	0.126	0.60	0.042
3.26	1.21	2.06	-296	90.9	56.6	3.98	0.758	0.135	0.62	0.044
4.14	1.53	2.61	-296	90.9	54.2	3.81	1.295	0.223	1.07	0.075
4.20	1.56	2.65	-296	90.9	61.6	4.33	1.262	0.230	1.03	0.072
4.27	1.58	2.69	-297	90.4	64.5	4.53	1.306	0.238	1.07	0.075
4.68	1.73	2.95	-295	91.5	64.6	4.54	1.550	0.287	1.26	0.089
5.09	1.88	3.21	-296	90.9	63.3	4.45	1.840	0.341	1.50	0.105
6.17	2.29	3.89	-296	90.9	61.7	4.34	2.672	0.501	2.17	0.153
6.24	2.31	3.94	-297	90.4	47.7	3.35	2.755	0.514	2.24	0.157
7.28	2.70	4.59	-298	89.8	44.4	3.12	3.728	0.697	3.03	0.213
7.41	2.74	4.68	-297	90.4	51.9	3.65	3.869	0.724	3.15	0.221
			Avg = -296	90.9						

Observed Differential Pressure (PSID) = $0.14Q^2 + 0.03Q$ $\overline{X} = 0.04$; $\sigma = 0.02$
LO_2 Temp = -296°F; S.G. = 1.14; cp = 0.192

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

TABLE B-69

Test No.: 017 Test Fluid: LO_2
Test Specimen: 80 X 700 TDDW Specimen diameter: 3.607 cm(1.420 in.); Area = 10.219 sq.cm. (1.584 sq.in.)

Flow Rate Versus Differential Pressure

Test Specimen Inlet Conditions							Differential Pressure			
Average Flow Rate			Temperature		Pressure		Avg. "Gross"	"Tare"	Observed "Net"	
(GPM)	(Liters/min/sq.cm.)	(GPM/in2)	(°F)	(°K)	(psia)	(Kg/sq.cm.)	(psid)	(psid)	(psid)	(Kg/sq.cm. differential)
2.29	0.85	1.44	-293	92.6	62.2	4.37	0.422	0.059	0.36	0.025
2.54	0.94	1.60	-294	92.0	59.3	4.17	0.531	0.077	0.45	0.032
3.02	1.12	1.91	-293	92.6	62.8	4.41	0.728	0.115	0.61	0.043
3.04	1.13	1.92	-294	92.0	61.4	4.32	0.752	0.116	0.64	0.045
3.09	1.14	1.95	-292	93.2	60.8	4.27	0.748	0.120	0.63	0.044
3.16	1.17	1.99	-294	92.0	60.7	4.27	0.791	0.126	0.67	0.047
4.11	1.52	2.59	-293	92.6	58.6	4.12	1.291	0.220	1.07	0.075
4.19	1.55	2.64	-294	92.0	61.4	4.32	1.354	0.229	1.13	0.079
4.21	1.56	2.66	-294	92.0	58.7	4.13	1.371	0.232	1.14	0.080
4.24	1.57	2.68	-294	92.0	60.0	4.22	1.404	0.236	1.17	0.082
5.05	1.87	3.19	-295	91.5	58.8	4.13	1.922	0.336	1.59	0.112
5.14	1.90	3.24	-295	91.5	56.7	3.99	2.024	0.347	1.68	0.118
5.26	1.95	3.32	-294	92.0	59.9	4.21	2.101	0.365	1.74	0.122
5.27	1.95	3.33	-294	92.0	55.8	3.92	2.121	0.367	1.75	0.123
5.85	2.18	3.71	-296	90.9	57.5	4.04	2.603	0.456	2.15	0.151
5.99	2.22	3.78	-295	91.5	53.5	3.76	2.702	0.473	2.23	0.157
6.19	2.29	3.91	-295	91.5	54.2	3.81	2.879	0.506	2.37	0.167
6.22	2.30	3.93	-295	91.5	58.1	4.08	2.887	0.511	2.38	0.167
6.99	2.58	4.41	-295	91.5	52.0	3.65	3.612	0.644	2.97	0.209
7.15	2.65	4.51	-296	90.9	54.7	3.84	3.761	0.673	3.09	0.217
7.24	2.68	4.57	-296	90.9	55.6	3.91	3.877	0.691	3.19	0.224
			Avg = -294	92.0						

Observed Differential Pressure (PSID) = $0.14Q^2 + 0.05Q$ $\overline{X} = 0.02$; $\sigma = 0.03$
LO_2 Temp = -294°F; S.G. = 1.13; cp = 0.184

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

TABLE B-70

Test No.: G18   Test Fluid: LO_2
Test Specimen: 165 X 1400 TDDW   Specimen diameter: 3.607 cm. (1.420 in.); Area = 10.219 sq.cm. (1.584 sq.in.)

Flow Rate Versus Differential Pressure

Test Specimen Inlet Conditions: Average Flow Rate (GPM)	Average Flow Rate (Liters/min/sq.cm.)	Average Flow Rate (GPM/in2)	Temperature (°F)	Temperature (°K)	Pressure (psia)	Pressure (Kg/sq.cm.)	Differential Pressure: Avg. "Gross" (psid)	Differential Pressure: "Tare" (psid)	Observed "Net" (psid)	Observed "Net" (Kg/sq.cm. differential)
2.19	0.81	1.38	-291	93.7	59.7	4.20	0.364	0.053	0.31	0.022
2.29	0.84	1.44	-292	93.2	49.6	3.49	0.382	0.059	0.32	0.022
2.36	1.06	1.80	-290	94.3	56.8	3.99	0.608	0.101	0.51	0.036
3.04	1.13	1.92	-291	93.7	58.7	4.13	0.704	0.116	0.59	0.041
3.10	1.15	1.96	-293	92.6	56.8	3.99	0.681	0.122	0.56	0.039
3.10	1.15	1.96	-293	92.6	49.7	3.49	0.633	0.122	0.51	0.036
3.93	1.46	2.48	-292	93.2	54.9	3.86	1.104	0.201	0.90	0.063
4.00	1.48	2.52	-294	92.0	49.5	3.48	1.152	0.208	0.94	0.066
4.16	1.54	2.63	-291	93.7	52.2	3.67	1.222	0.227	1.00	0.070
4.20	1.55	2.65	-294	92.0	58.6	4.12	1.241	0.230	1.01	0.071
4.89	1.81	3.09	-294	92.0	45.9	3.23	1.634	0.315	1.32	0.093
4.91	1.82	3.10	-295	91.5	49.4	3.47	1.717	0.317	1.40	0.098
4.93	1.83	3.11	-294	92.0	52.1	3.66	1.631	0.320	1.31	0.092
5.11	1.89	3.23	-295	91.5	56.5	3.97	1.836	0.345	1.49	0.105
5.95	2.20	3.76	-295	91.5	51.7	3.63	2.473	0.468	2.01	0.141
5.95	2.20	3.76	-292	93.2	51.7	3.63	2.385	0.468	1.92	0.135
5.97	2.21	3.77	-294	92.0	40.8	2.87	2.423	0.471	1.95	0.137
6.07	2.25	3.83	-295	91.5	56.3	3.96	2.521	0.486	2.04	0.143
6.63	2.46	4.18	-296	90.9	55.9	3.93	2.958	0.578	2.38	0.167
5.78	2.51	4.28	-295	91.5	50.6	3.56	3.158	0.606	2.55	0.179
6.35	2.54	4.32	-295	91.5	46.5	3.27	3.196	0.618	2.58	0.181
6.95	2.58	4.39	-295	91.5	46.9	3.30	3.293	0.638	2.66	0.187
7.31	2.71	4.61	-296	90.9	49.3	3.47	3.601	0.703	2.90	0.204
			Avg = -293	92.6						

Observed Differential Pressure (PSID) = $0.13Q^2 + 0.04Q$ $\overline{X} = 0.03$ $\sigma = 0.04$
LO_2 Temp = -293°F; S.G. = 1.13; cp = 0.184

TABLE B-71

Test No.: 019 Test Fluid: LO_2
Test Specimen: 325 X 2300 TDDW Specimen diameter: 3.607 cm.(1.420 in.); Area = 10.219 sq.cm. (1.584 sq.in.)

Flow Rate Versus Differential Pressure

Average Flow Rate (GPM)	Average Flow Rate (Liters/min/sq.cm.)	Average Flow Rate (GPM/in2)	Temperature (°F)	Temperature (°K)	Pressure (psia)	Pressure (Kg/sq.cm.)	Avg. "Gross" (psid)	"Tare" (psid)	Observed "Net" (psid)	Observed "Net" (Kg/sq.cm. differential)
2.02	0.75	1.27	-292	93.2	57.3	4.03	0.775	0.043	0.73	0.051
2.12	0.78	1.34	-292	93.2	53.6	3.77	0.864	0.050	0.81	0.057
2.99	1.11	1.89	-294	92.0	57.7	4.06	1.517	0.113	1.40	0.098
3.02	1.12	1.91	-291	93.7	54.9	3.86	1.548	0.115	1.43	0.100
3.04	1.13	1.92	-294	92.0	60.8	4.27	1.517	0.117	1.40	0.098
3.09	1.14	1.95	-294	92.0	59.8	4.20	1.647	0.121	1.53	0.107
3.94	1.46	2.49	-295	91.5	58.1	4.08	2.469	0.203	2.27	0.159
3.98	1.47	2.51	-295	91.5	56.8	3.99	2.378	0.206	2.17	0.152
4.10	1.52	2.59	-294	92.0	54.0	3.80	2.582	0.220	2.36	0.166
4.37	1.62	2.76	-293	92.6	54.0	3.80	2.947	0.251	2.70	0.190
5.02	1.86	3.17	-295	91.5	53.4	3.75	3.545	0.333	3.21	0.226
5.14	1.90	3.24	-295	91.5	59.9	4.21	3.772	0.348	3.42	0.240
6.05	2.24	3.82	-296	90.9	54.9	3.86	5.001	0.484	4.52	0.318
6.08	2.25	3.84	-295	91.5	55.5	3.90	5.118	0.489	4.63	0.325
6.16	2.28	3.89	-295	91.5	51.5	3.62	5.297	0.502	4.79	0.337
6.87	2.54	4.34	-296	90.9	51.7	3.63	6.225	0.624	5.60	0.394
7.11	2.63	4.49	-296	90.9	52.5	3.69	6.705	0.668	6.04	0.425
7.30	2.70	4.61	-295	91.5	46.6	3.28	6.974	0.704	6.27	0.441
			Avg. = -295	Avg = 91.5						

Observed Differential Pressure = $0.23Q^2 + 0.310Q$ $\overline{X} = 0.04$ $\sigma = 0.06$
LO_2 Temp. = -295°F; S.G. = 1.13; cp = 0.189

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

TABLE B-72

Test No: 013 Test Fluid: LO_2
Test Specimen: 30 X 160 PDSW Specimen diameter: 3.607 cm. (1.420 in.) ; Area = 10.219 sq.cm. (1.584 sq.in.)

Test Specimen Inlet Conditions: Average Flow Rate (GPM/in^2)	Test Specimen Inlet Conditions: Temperature (°F)	Differential Pressure Observed "Net" (psid)	Predicted* Differential Pressure (psid)	Differential Pressure Deviation (Observed-Predicted)	Percent Deviat from Predicted
1.31	-293	0.07	0.05	+0.02	40.0
1.32	-292	0.08	0.05	+0.03	60.0
1.82	-292	0.11	0.10	+0.01	10.0
1.89	-294	0.14	0.11	+0.03	27.3
1.92	-294	0.13	0.11	+0.02	18.2
1.95	-294	0.14	0.11	+0.03	27.3
2.49	-295	0.22	0.18	+0.04	22.2
2.56	-295	0.22	0.19	+0.03	15.8
2.59	-293	0.22	0.20	+0.02	10.0
2.60	-293	0.19	0.20	-0.01	5.0
3.21	-294	0.35	0.30	+0.05	16.7
3.23	-295	0.33	0.30	+0.03	10.0
3.24	-295	0.35	0.30	+0.05	16.7
3.31	-294	0.33	0.31	+0.02	6.4
3.59	-296	0.41	0.37	+0.04	10.8
3.78	-296	0.46	0.41	+0.05	12.2
3.83	-295	0.40	0.42	+0.02	4.8
4.00	-295	0.49	0.46	+0.03	6.5
4.30	-296	0.54	0.52	+0.02	3.8
4.46	-296	0.58	0.56	+0.02	3.6
	Avg. = -294				Avg. = 16.4

*Predicted Differential Pressure = $0.027Q^2 + 0.006Q$
LO_2 Temp = -294°F; S.G. = 1.13; cp = 0.186

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

TABLE B-73

est No: 014 Test Fluid: LO_2
est Specimen: 80 X 400 PDSW Specimen diameter: 3.607 cm.(1.420 in.); Area = 10.219 sq.cm.(1.584 sq.in.)

Test Specimen Inlet Conditions		Differential Pressure Observed "Net" (psid)	Predicted* Differential Pressure (psid)	Differential Pressure Deviation (Observed-Predicted)	Percent Deviation from Predicted
erage Flow Rate (GPM/in^2)	Temperature (°F)				
1.42	-295	0.05	0.08	-0.03	37.5
1.52	-296	0.08	0.09	-0.01	1.0
1.86	-296	0.10	0.13	-0.03	23.1
1.93	-295	0.10	0.14	-0.04	28.6
1.94	-294	0.13	0.14	-0.01	7.1
1.95	-296	0.12	0.15	-0.03	20.0
2.51	-295	0.20	0.23	-0.03	13.0
2.60	-295	0.18	0.25	-0.07	28.0
2.62	-297	0.22	0.25	-0.03	12.0
2.71	-297	0.23	0.27	-0.04	14.8
3.02	-296	0.29	0.32	-0.03	9.4
3.09	-297	0.31	0.34	-0.03	8.8
3.12	-297	0.26	0.35	-0.09	25.7
3.31	-297	0.34	0.39	-0.05	12.8
3.71	-297	0.44	0.48	-0.04	8.3
3.78	-297	0.44	0.50	-0.06	12.0
3.79	-297	0.42	0.50	-0.08	16.0
4.04	-297	0.45	0.56	-0.11	19.6
4.22	-298	0.53	0.61	-0.08	13.1
4.27	-298	0.53	0.62	-0.09	14.5
4.43	-298	0.59	0.67	-0.08	11.9
4.49	-298	0.59	0.69	-0.10	14.5
4.49	-298	0.61	0.69	-0.08	11.6
	Avg = -297				Avg = 15.8

*Differential Pressure (PSID) = $0.031Q^2 + 0.014Q$
LO_2 Temp = -297°F; S.G. = 1.14; cp = 0.194

TABLE B-74

Test No: 015 Test Fluid: LO_2
Test Specimen: 2 X 120 X 650 PDSW Specimen diameter: 3.607 cm.(1.420 in.); Area = 10.219 sq.cm.(1.584 sq.in.)

Test Specimen Inlet Conditions		Differential Pressure Observed "Net" (psid)	Predicted* Differential Pressure (psid)	Differential Pressure Deviation (Observed-Predicted)	Percent Deviation from Predicted
Average Flow Rate (GPM/in²)	Temperature (°F)				
1.34	-292	0.13	0.12	+0.01	8.3
1.35	-292	0.13	0.13	0.00	0.0
1.37	-293	0.14	0.13	+0.01	7.7
1.34	-293	0.24	0.22	+0.02	9.1
1.85	-290	0.23	0.22	+0.01	4.5
1.87	-293	0.24	0.22	+0.02	9.1
1.93	-295	0.26	0.25	+0.01	4.0
2.53	-294	0.42	0.39	+0.03	7.7
2.61	-295	0.45	0.41	+0.04	9.7
2.62	-294	0.46	0.42	+0.04	9.5
2.63	-291	0.44	0.4[illegible]	+0.02	4.8
3.15	-295	0.62	0.59	+0.03	4.8
3.17	-294	0.62	0.59	+0.03	5.1
3.19	-295	0.64	0.60	+0.04	6.3
3.23	-292	0.66	0.63	+0.03	4.8
3.72	-295	0.85	0.80	+0.05	6.2
3.76	-293	0.85	0.82	+0.03	3.6
3.79	-295	0.87	0.83	+0.04	4.6
3.86	-295	0.91	0.86	+0.05	5.8
4.41	-296	1.16	1.11	+0.05	4.5
4.59	-294	1.25	1.20	+0.05	4.2
4.63	-294	1.27	1.22	+0.05	4.1
	Avg = -294				Avg = 5.8

*Differential Pressure (PSID) = $0.052Q^2 + 0.023Q$
LO_2 Temp = -294°F; S.G. = 1.13; cp = 0.186

TABLE B-75

Test No: 016 Test Fluid: LO_2
Test Specimen: 30 X 250 TDDW Specimen diameter: 3.607 cm.(1.420 in.); Area = 10.219 sq.cm.(1.584 sq.in.)

Test Specimen Inlet Conditions		Differential Pressure	Predicted* Differential Pressure (psid)	Differential Pressure Deviation (Observed-Predicted)	Percent Deviation from Predicted
Average Flow Rate (GPM/in²)	Temperature (°F)	Observed "Net" (psid)			
1.44	-294	0.32	0.39	-0.07	17.9
1.55	-294	0.39	0.45	-0.06	13.3
1.93	-295	0.59	0.69	-0.10	14.5
1.96	-293	0.56	0.71	-0.15	21.1
1.99	-295	0.60	0.73	-0.13	17.8
2.06	-296	0.62	0.78	-0.16	20.5
2.61	-296	1.07	1.25	-0.18	14.4
2.65	-296	1.03	1.29	-0.26	20.1
2.69	-297	1.07	1.33	-0.26	19.5
2.95	-295	1.26	1.60	-0.34	21.2
3.21	-296	1.50	1.89	-0.39	20.6
3.89	-296	2.17	2.76	-0.59	21.4
3.94	-297	2.24	2.83	-0.59	20.8
4.59	-298	3.03	3.84	-0.81	21.1
4.63	-297	3.14	3.99	-0.85	21.3
	Avg = -296				Avg = 19.0

*Differential Pressure (PSID) = $0.18Q^2 + 0.01Q$
LO_2 Temp = -296°F; S.G. = 1.14; cp = 0.192

TABLE B-76

Test No: 017 Test Fluid: LO_2 Specimen diameter: 3.607 cm.(1.420 in.); Area = 10.219 sq.cm.(1.584 sq.in.)
Test Specimen: 80 X 700 TDDW

Test Specimen Inlet Conditions: Average Flow Rate (GPM/in²)	Test Specimen Inlet Conditions: Temperature (°F)	Differential Pressure Observed "Net" (psid)	Predicted* Differential Pressure (psid)	Differential Pressure Deviation (Observed-Predicted)	Percent Deviation from Predicted
1.44	-293	0.36	0.41	-0.05	12.2
1.60	-294	0.45	0.50	-0.05	10.0
1.91	-293	0.61	0.70	-0.09	12.9
1.92	-294	0.64	0.70	-0.06	8.5
1.95	-292	0.63	0.72	-0.09	12.5
1.99	-294	0.67	0.75	-0.08	10.7
2.59	-293	1.07	1.24	-0.17	13.7
2.64	-294	1.13	1.29	-0.16	12.4
2.66	-294	1.14	1.31	-0.17	13.0
2.68	-294	1.17	1.33	-0.16	12.0
3.19	-295	1.59	1.86	-0.27	14.5
3.24	-295	1.68	1.91	-0.23	12.0
3.32	-294	1.74	2.01	-0.27	13.4
3.33	-294	1.75	2.02	-0.27	13.4
3.71	-296	2.15	2.49	-0.34	13.6
3.78	-295	2.23	2.58	-0.35	13.6
3.91	-295	2.37	2.75	-0.38	13.8
3.93	-295	2.38	2.78	-0.40	14.4
4.41	-295	2.97	3.48	-0.51	14.6
4.51	-296	3.09	3.64	-0.55	15.1
4.57	-296	3.19	3.73	-0.54	14.5
	Avg. = -294				Avg. = 12.9

*Differential Pressure (PSID) = $0.17Q^2 + 0.04Q$
LO_2 Temp = -294°F; S.G. = 1.13; cp = 0.166

TABLE B-77

Test No: 018 Test Fluid: LO_2
Test Specimen: 165 X 1400 TDDW Specimen diameter: 3.607 cm.(1.420 in.); ARea = 10.219 sq.cm.(1.584 sq.in.)

Test Specimen Inlet Conditions: Average Flow Rate (GPM/in^2)	Test Specimen Inlet Conditions: Temperature (°F)	Differential Pressure Observed "Net" (psid)	Predicted* Differential Pressure (psid)	Differential Pressure Deviation (Observed-Predicted)	Percent Deviation from Predicted
1.35	-291	0.31	0.31	0.00	0.0
1.44	-292	0.32	0.34	-0.02	5.9
1.80	-290	0.51	0.49	+0.02	4.1
1.92	-291	0.59	0.54	+0.05	9.2
1.96	-293	0.56	0.56	0.00	0.0
1.96	-293	0.51	0.56	-0.05	8.9
2.43	-292	0.90	0.84	+0.06	7.1
2.52	-294	0.94	0.86	+0.08	9.3
2.63	-291	1.00	0.93	+0.07	7.5
2.65	-294	1.01	0.94	+0.07	7.4
3.09	-294	1.32	1.23	+0.09	7.3
3.10	-295	1.40	1.24	+0.16	12.9
3.11	-294	1.31	1.25	+0.06	4.8
3.23	-295	1.49	1.33	+0.16	12.0
3.75	-295	2.01	1.75	+0.26	14.9
3.76	-292	1.92	1.75	+0.17	9.7
3.77	-294	1.95	1.76	+0.19	10.8
3.83	-295	2.04	1.81	+0.23	12.7
4.15	-296	2.38	2.12	+0.26	12.3
4.28	-295	2.55	2.22	+0.33	14.9
4.32	-295	2.58	2.25	+0.33	14.7
4.39	-295	2.66	2.32	+0.34	14.7
4.61	-296	2.90	2.54	+0.36	14.2
	Avg. = -293				Avg. = 10.1

*Predicted Differential Pressure (PSID) = $0.10Q^2 + 0.09Q$
LO_2 Temp = -293°F; S.G. = 1.13; cp = 0.184

TABLE B-78

Test No: 019 Test Fluid: LO_2
Test Specimen: 325 X 2300 TDDW Specimen diameter: 3.607 cm.(1.420 in.); Area = 10.219 sq.cm. (1.584 sq.in.)

Test Specimen Inlet Conditions: Average Flow Rate (GPM/in²)	Test Specimen Inlet Conditions: Temperature (°F)	Differential Pressure Observed "Net" (psid)	Predicted* Differential Pressure (psid)	Differential Pressure Deviation (Observed-Predicted)	Percent Deviati from Predicted
1.27	-292	0.73	0.69	+0.04	5.8
1.34	-292	0.81	0.74	+0.07	9.4
1.89	-294	1.40	1.27	+0.13	10.2
1.91	-291	1.43	1.29	+0.14	10.8
1.92	-294	1.40	1.30	+0.10	7.7
1.95	-294	1.53	1.33	+0.20	15.0
2.49	-295	2.27	1.98	+0.29	14.6
2.51	-295	2.17	2.01	+0.16	8.0
2.59	-294	2.36	2.12	+0.24	11.3
2.76	-293	2.70	2.35	+0.35	14.9
3.17	-295	3.21	2.98	+0.23	7.7
3.24	-295	3.42	3.09	+0.33	10.7
3.82	-296	4.52	4.11	+0.41	10.0
3.84	-295	4.63	4.15	+0.48	11.6
3.89	-295	4.79	4.24	+0.55	13.0
4.34	-296	5.60	5.14	+0.46	8.9
4.49	-296	6.04	5.46	+0.58	10.6
4.61	-295	6.27	5.73	+0.54	9.4
	Avg. = -295				Avg. = 10.5

* Predicted Differential Pressure = $0.21Q^2 + 0.274Q$
LO_2 Temp = -295°F; S.G. = 1.13; cp = 0.189

SPECIFIC GRAVITY OF LIQUID OXYGEN

Temperature (°F)	Specific Gravity
-349.4	1.236
-342.2	1.244
-333.2	1.221
-315.2	1.173
-306.2	1.150
-297.2	1.125
-245.7	0.961
-219.9	0.861
-201.4	0.767
-189.5	0.668
-184.3	0.594

$$\text{Specific Gravity} = -1.097528 - 0.01241266(°F) - 0.0000164187(°F)^2$$

Source: Design Data for Pressurized Gas Systems
Stanford Research Institute

VISCOSITY OF LIQUID OXYGEN

Temperature (°F)	Viscosity (cp)
-320.28	0.273
-315.6	0.250
-297.6	0.190
-259.8	0.123
-233.16	0.110

$$\text{Viscosity(cp)} = 1.2139 + 0.0095327939(°F) + 0.0000205387(°F)^2$$

TEST PROCEDURES

SECTION C

LIST OF FIGURES

TP-1

FLOW RESISTANCE TEST

1.0 **SCOPE**

This procedure describes the test methods and equipment to be used in determining the flow resistance (pressure drop) characteristics of various filter media in a liquid flow system. This procedure may also be used for determining the flow resistance of filter assemblies.

2.0 **TEST LIQUIDS**

Any liquid of interest may be used for testing. However, special precautions must be taken when testing with toxic flammable or cyrogenic liquids.

3.0 **PROCEDURE**

3.1 **General**

3.1.1 The equipment schematic is shown in Figure 1.

3.1.2 When testing filter media alone, it is necessary to provide a holding fixture or case to enclose the media sample. Filter assemblies may be connected directly into the test system.

3.2 **Test Set-Up**

3.2.1 The test item is installed in the test system with piezometer tubes attached directly to the inlet and outlet ports of the test item. The piezometer pressure tap must be located at least four (4) times the tube inside diameter upstream and at least ten (10) times the tube inside diameter downstream of any other connection using straight rigid lines.

3.3 **Pressure Drop Measurement**

3.3.1 **Gross Pressure Drop**

3.3.1.1 With the test item installed in the system, start flow and slowly increase to the maximum flow rate to be measured. It is essential that all air be driven through the filter medium to avoid "blinding" of the medium. To force air through a fine screen, it is necessary to develop a differential pressure across the screen in excess of the bubble point pressure of the screen. Normally, for media as fine as 5 or 10 microns average pore size, a differential

pressure of 2 psid with water and 3 psid with hydraulic oil would be required to force all air through the media.

3.3.1.2 Set the flow at the maximum value planned for the test, allow to stabilize and record the pressure difference between the upstream and downstream pressure taps.

3.3.1.3 Repeat the process of stabilising flow and recording pressure drop at a series of at least five (5) equally divided steps. This will provide five plotting points to provide a graph of flow rate vs. pressure drop. More flow "steps" through the flow range will provide more accurate plotting data.

3.3.1.4 After recording the pressure drop for the lowest flow point, increase flow in a series of steps in reverse order to those selected in 3.3.1.3.

3.3.1.5 The pressure drop vs. flow rate determinations recorded in 3.3.1.4 must compare favorably (within instrumentation and measurement tolerances) to those obtained in 3.3.1.5. Higher pressure drop readings obtained in 3.3.1.4 indicate progressive clogging of the filter media and is a result of contamination of the flow system. It is essential that the upstream "clean-up filter" be capable of removal of all particulate contaminant which would be trapped by the test item.

3.3.2 Tare Pressure Drop

3.3.2.1 As the total pressure drop measured in 3.3.1 includes the flow lines between the pressure taps and the flow passage of the specimen holder or filter housing, it is necessary to determine the portion of total pressure drop contributed by these items.

3.3.2.2 Remove the tested filter media from the specimen holder. (If separable filter assemblies are being tested, remove the filter element from the assembly). Reinstall the empty holder or filter body in the test system exactly as installed for the screen test.

3.3.2.3 Repeat the flow vs. pressure drop determination of 3.3.1.2 and 3.3.1.3 to determine the pressure drop caused by the system and specimen housing.

3.3.3 Determination of Net Pressure Drop

3.3.3.1 Subtract the value of the tare pressure drop form the value of the gross pressure drop to determine the pressure drop caused by the tested screen sample or filter element.

3.3.3.2 If the gross pressure drop and tare pressure drops were recorded at different flow rates, it is necessary to plot the data for each point, draw smooth curves connecting the points and read off the pressure drops corresponding to specific flow points. Subtraction of tare from gross readings will provide data points for plotting "net" pressure drop.

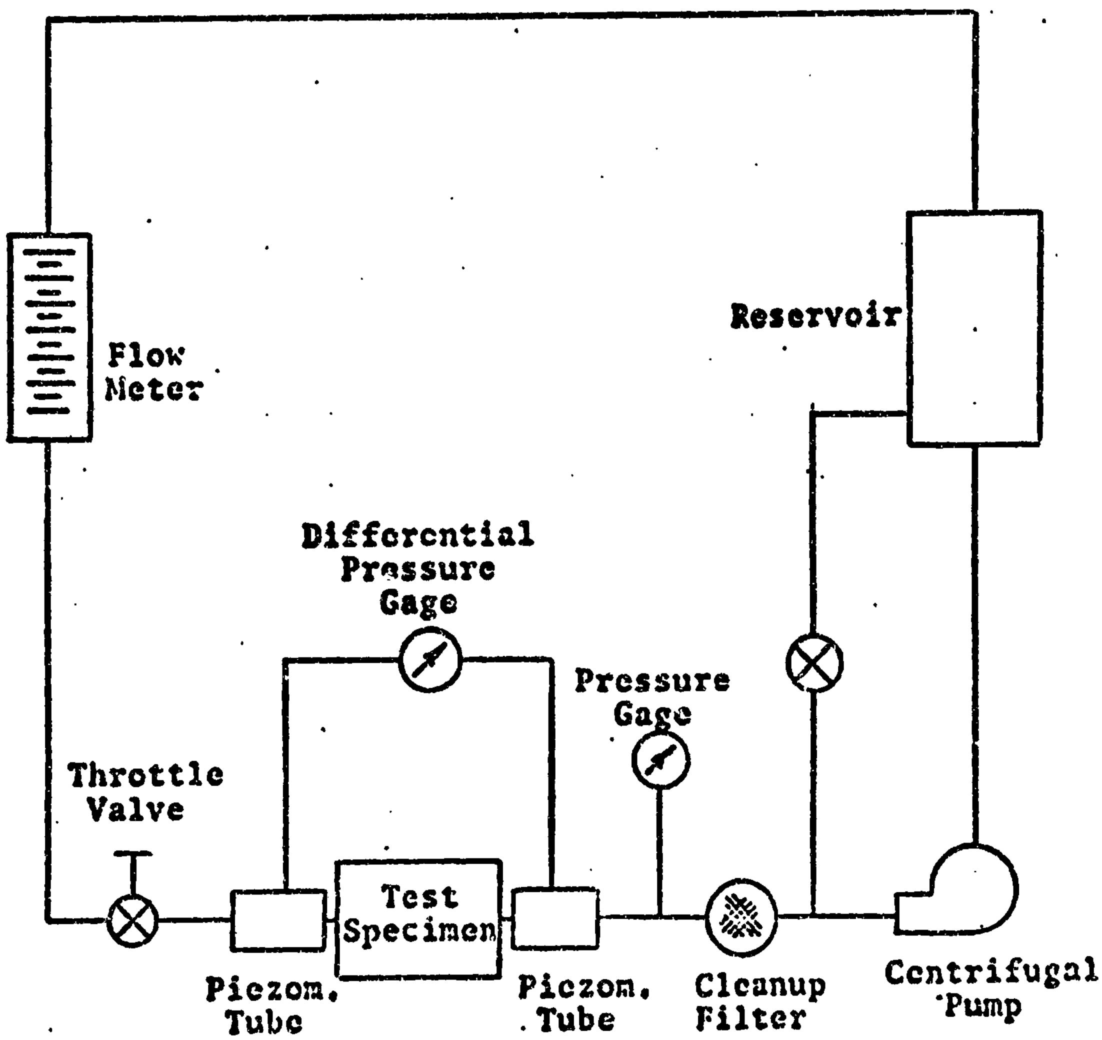

FIGURE C-1

FLOW TEST SCHEMATIC

TP-2

CONTAMINANT TOLERANCE AND TRANSMISSION TEST

1.0 SCOPE

This procedure defines a method of determining the resultant increase in differential pressure across a filter medium at a specific flow rate of test fluid caused by injection of controlled amounts of test contaminant into the flow system upstream of the filter. In addition, by sampling the effluent fluid, the maximum size of particle transmitted through the filter may be determined as well as the resultant contaminant distribution in the filter effluent. The test fluid must be specified as well as the set-up and test contaminant. Results will vary using different test fluids, contaminants, or cleanup filters.

2.0 EQUIPMENT

The schematic of a typical test system is shown in Figure 1.

3.0 TEST VARIATIONS

3.1 Clean-up Filters

The schematic of Figure 1 shows a clean-up filter installed upstream of the dust addition valve. The test may be run with or without a clean-up filter in the flow circuit.

Whether or not the clean-up filter is in the circuit depends on the end usage of the filter being tested. If the unit is to be used as the main (mass) filter in a recirculating hydraulic system with return reservoir, the clean-up filter should be by-passed during the test to simulate actual system conditions. If the filter end usage is in a propellant or gas system where fluid passing through is expended, a clean-up filter must be in the circuit during test.

The reason for the above variation in test set-up is that in a recirculating system, fine particles that may initially pass through the clean filter will be carried by the recirculating fluid and be brought back to the filter that has become partially clogged and operates as a finer filter than when in the clean condition. The fine material will now be trapped adding to the pressure differential across the filter.

In a non-recirculating system such as gas pressurization or propellant, the fluid and particles that once pass through the filter are expended and cannot return. The clean-up filter must effectively trap these fine particles in order to simu-

late the operating conditions of non-recirculating systems.

The test report must specify the type and rating of the clean-up filter if used during the test.

3.2 Contaminant Addition Methods

Test contaminant may be added continuously or in a series of incremental adds. Normally, a minimum of five (5) adds are required at a maximum time interval of four (4) minutes each.

The contaminant used for testing may be varied, but the specification or particle size analysis of the test contaminant must be recorded together with batch number, lot number, etc.

4.0 PROCEDURE

4.1 System Pressure Drop (Tare)

With the clean-up filter in the circuit, establish flow and sample the fluid until it is determined to be clean.

Install the test specimen or the filter housing with no filter media and establish flow at the specified flow rate. Record pressure drop between the pressure taps. This is the "tare" pressure drop and represents that portion of the total or "gross" pressure drop contributed by the flow lines and screen holder or filter housing.

4.2 Gross Pressure Drop

Install the filter medium to be tested in its holder or the element in its housing and establish flow at the specified flow rate.

The clean-up filter may be left in the circuit or by-passed depending on the type of test being conducted (See Paragraph 3.0).

Test contaminant, pre-weighed in individual containers or fed from a continuous injection system is added through the dust valve or injection mechanism without changing flow rate. It is necessary to control flow rate by adjustment of the throttle valve as the differential pressure rises across the test specimen.

After each incremental addition, observation of the differential pressure gage will indicate stabilization of pressure drop. Each addition will cause an abrupt increase of pressure drop followed by a slight rise as the contaminant settles into the filter medium. After stabilization occurs, the next incremental add

is made and this process is repeated until the desired amount of contaminant is injected or the desired differential pressure is reached.

After each incremental addition of contaminant and stabilization of pressure differential, record the amount of contaminant added, the time of addition, the flow rate, pressure drop and temperature of the test fluid.

4.3 <u>Net Pressure Drop</u>

The net pressure drop of the filter medium is determined by subtracting the "tare" pressure drop at the specified flow rate from each of the gross pressure drop readings obtained in 4.2.

4.4 <u>Tranmission Test</u>

4.4.1 Test Variations

The test may be conducted by continuous sampling of filter effluent or intermittant sampling.

4.4.1.1 Continuous Sample

4.4.1.1.1 As shown in Figure 1, a sampling port and membrane filter holder is located downstream of the test specimen. During the entire tolerance capacity test, a continuous sample of effluent fluid is withdrawn and filtered through the in-place membrane filter. The detailed operational procedure is as follows:

a) Establish flow through the system at the desired flow rate with the test specimen installed. Open sampler shut off valve.

b) With a 3.0 micron or finer membrane filter installed in the membrane filter holder at the sampling port, begin flow through the membrane filter of at least 50 ml per minute. Provide a container at the downstream side of the membrane filter to collect the sample effluent. Control sample flow rate by means of sample flow control valve.

c) Conduct contaminant tolerance test in accordance with paragraph 4.2.

d) At the conclusion of the contaminant tolerance test, remove the membrane filter holder from the system and examine microscopically in accordance with the procedure of SAE ARP 598 to determine the largest particle transmitted and/or the particle size distribution of the sample.

e) Record largest particle and/or particle distribution, flow rate, temperature

total time of test, test fluid, total volume of sample, and type of contaminant used.

4.4.1.2 Intermittant Test

4.4.1.2.1 The test is begun as in step (a) of 4.4.1.1.1, except that flow through the sampler is started 10 to 15 seconds prior to the first contaminant addition and sample flow is stopped one (1) minute after each contaminant add is made.

a) With membrane filter installed as in step (a) of 4.4.1.1.1, establish system flow at desired rate and open sampler shut-off valve.

b) 10 to 15 seconds prior to the first contaminant add, open the sampling flow control valve and begin sample flow through the membrane filter at 50 mil/minute minimum.

c) Make first contaminant add.

d) One minute after the first add, close sample valve.

e) Open sample valve 10 to 15 seconds prior to each successive contaminant add and close one minute after each contaminant add.

NOTE: If contaminant is added at approximately one (1) to two (2) minute intervals or if a continuous addition system is uded, the sample valve may be left open throughout the entire test.

f) Remove the filter membrane holder and examine microscopically for largest particle size per SAE ARP 598.

g) Record largest particle size, test fluid, flow rate, number of contaminant adds, temperature, total weight of contaminant added, and type of contaminant used.

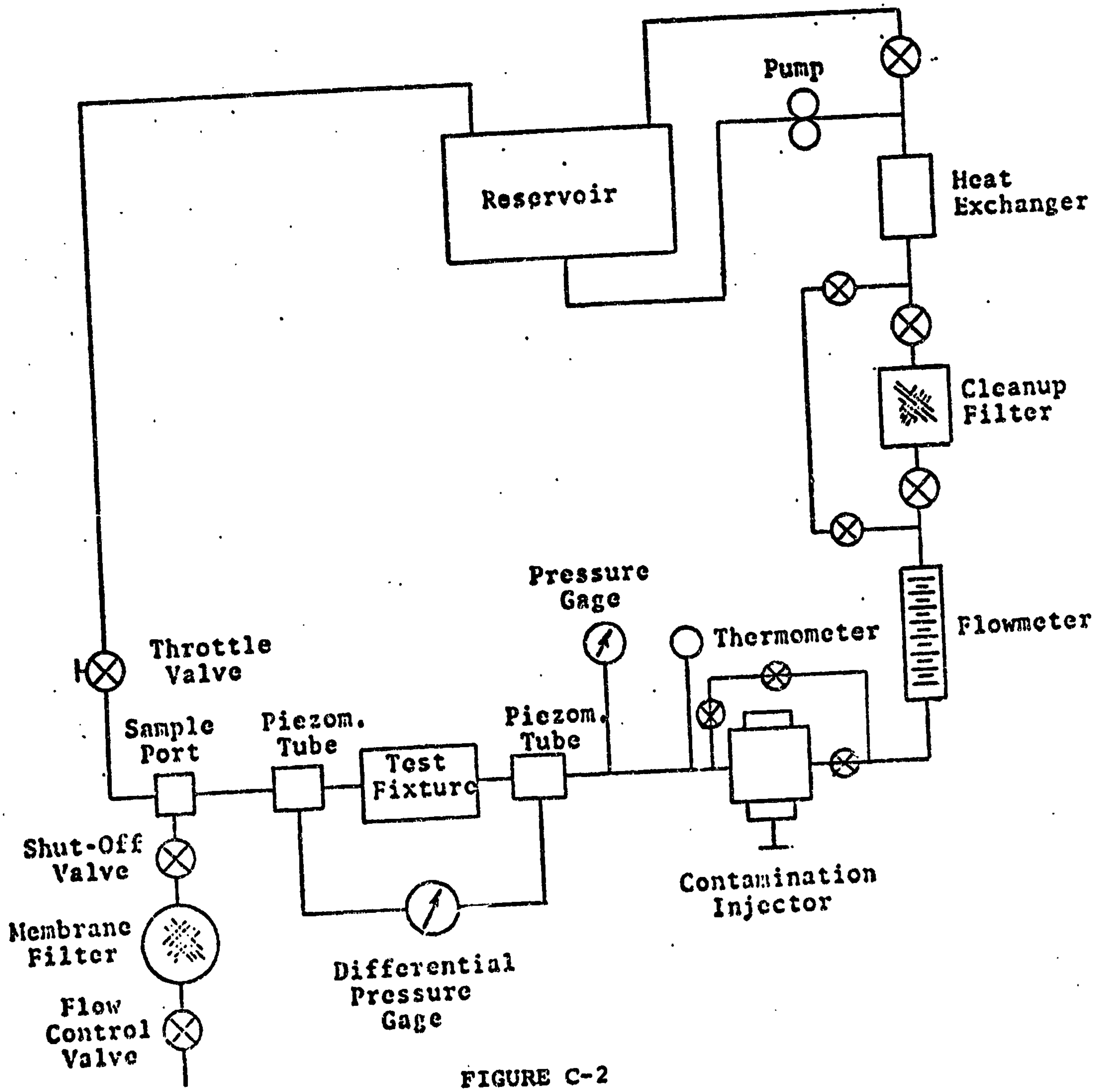

FIGURE C-2

CONTAMINATION TOLERANCE AND TRANSMISSION TEST SCHEMATIC

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DEVELOPMENT OF A CONTINUOUS CONTAMINANT ADDER

SECTION D

LIST OF FIGURES

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DEVELOPMENT OF A CONTINUOUS CONTAMINANT ADDER

1.0 INTRODUCTION

As noted in the section on contaminant tolerance tests in Volume I, the typical industry method of adding contaminant consists of opening the system at some point upstream of the test specimen, adding a preweighed "slug" of contaminant and by manipulating valves, allowing the contaminant to mix with the flowing fluid. As this method requires opening the system, it is impractical for use with toxic, flammable or cryogenic fluids.

Under this contract, a device was developed which continuously adds dry contaminant at a consistant and controllable rate to a flowing fluid system. Continuous addition precludes the necessity of opening the system to add increments of contaminant and thereby allows contaminant tolerance tests to be conducted with cryogenic systems. Furthermore, the smooth continuous injection of contaminants closely represents conditions existing in actual fluid systems.

2.0 DESCRIPTION AND OPERATION

The contaminant adder assembly shown in Figure D-1 functions as follows. A variable speed DC motor (1) operating through a 115 VAC speed control rotates the coupling (9). As the coupling rotates, it advances the shaft (7) which is threaded into a fixed cylinder assembly (8). As the shaft (7) rotates and advances, the piston (3) also rotates and advances thereby forcing the contaminant placed above the scraper (17) forward. By means of a pinned assembly, the shaft (7) also turns the sleeve (28). By thus rotating the shaft (7) and the sleeve (28), the contaminant is advanced while rotating. As the contaminant contacts the wedge (19), it drops into the vertical hole of the body (14). Limit switches (11) are provided to preclude "bottoming out" of components in either direction. The mount (25) attaches the body (14) and internal components to the vacuum chamber wall and also provides a secondary sealing provision to assure that if leakage occurs past the seals of the piston (3) or sleeve (28), the leaking fluid will be vented to atmosphere by means of a line from the mount (25) through the vacuum chamber wall. This is a safety feature only, as leakage of gas from the ullage chamber can allow the liquid level to rise and wet the contaminant. A special tool was designed to facilitate removal of the piston (3) and sleeve (28) assembly at the end of the test run. The tool also assures that no contaminant will fall out during removal. The principal feature incorporated into the contaminant adder design is the relatively long vertical hole in the body (1) which serves as a controlled ullage compartment. Its function is to maintain the contaminant in a dry condition throughout the test.

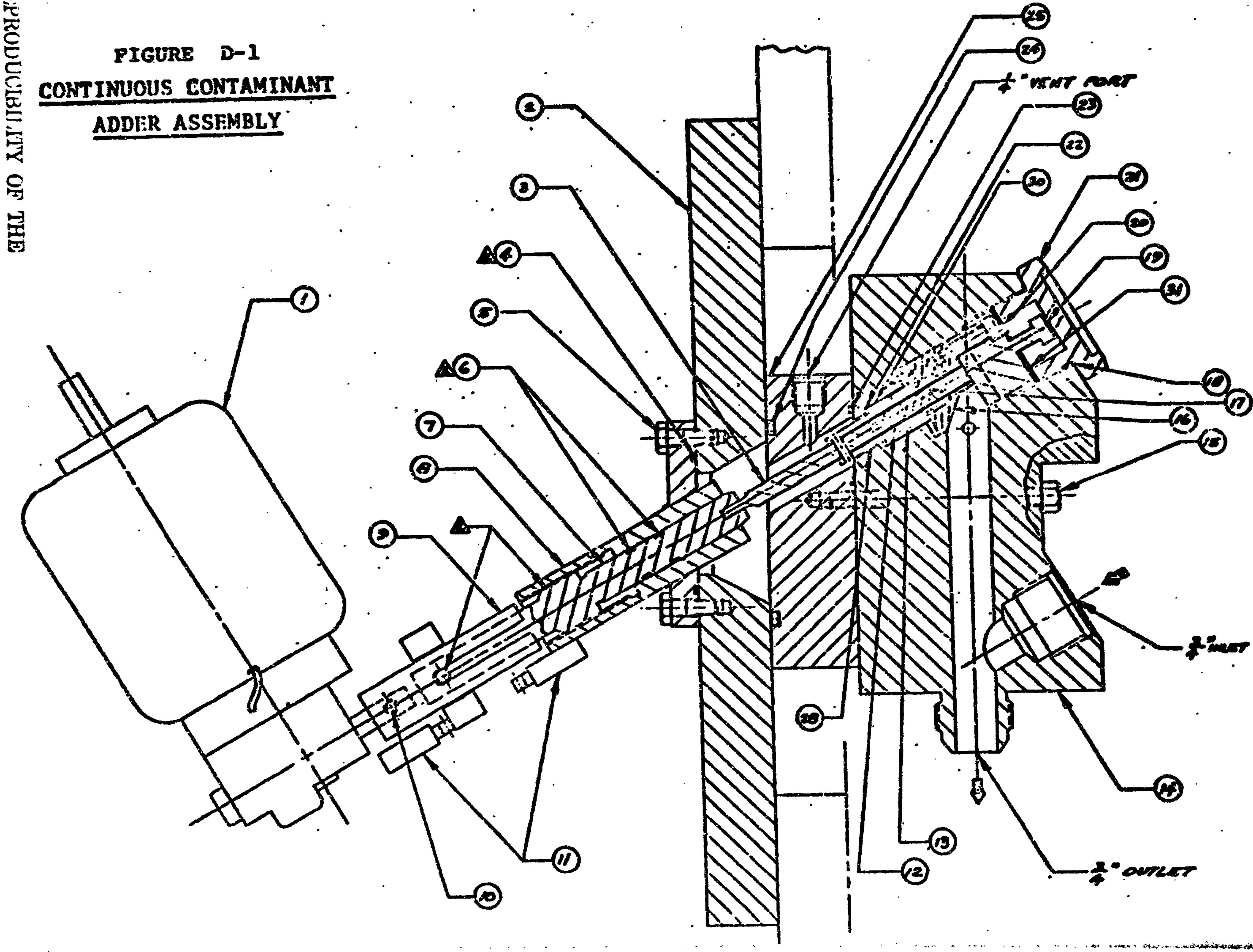


FIGURE D-1
CONTINUOUS CONTAMINANT
ADDER ASSEMBLY

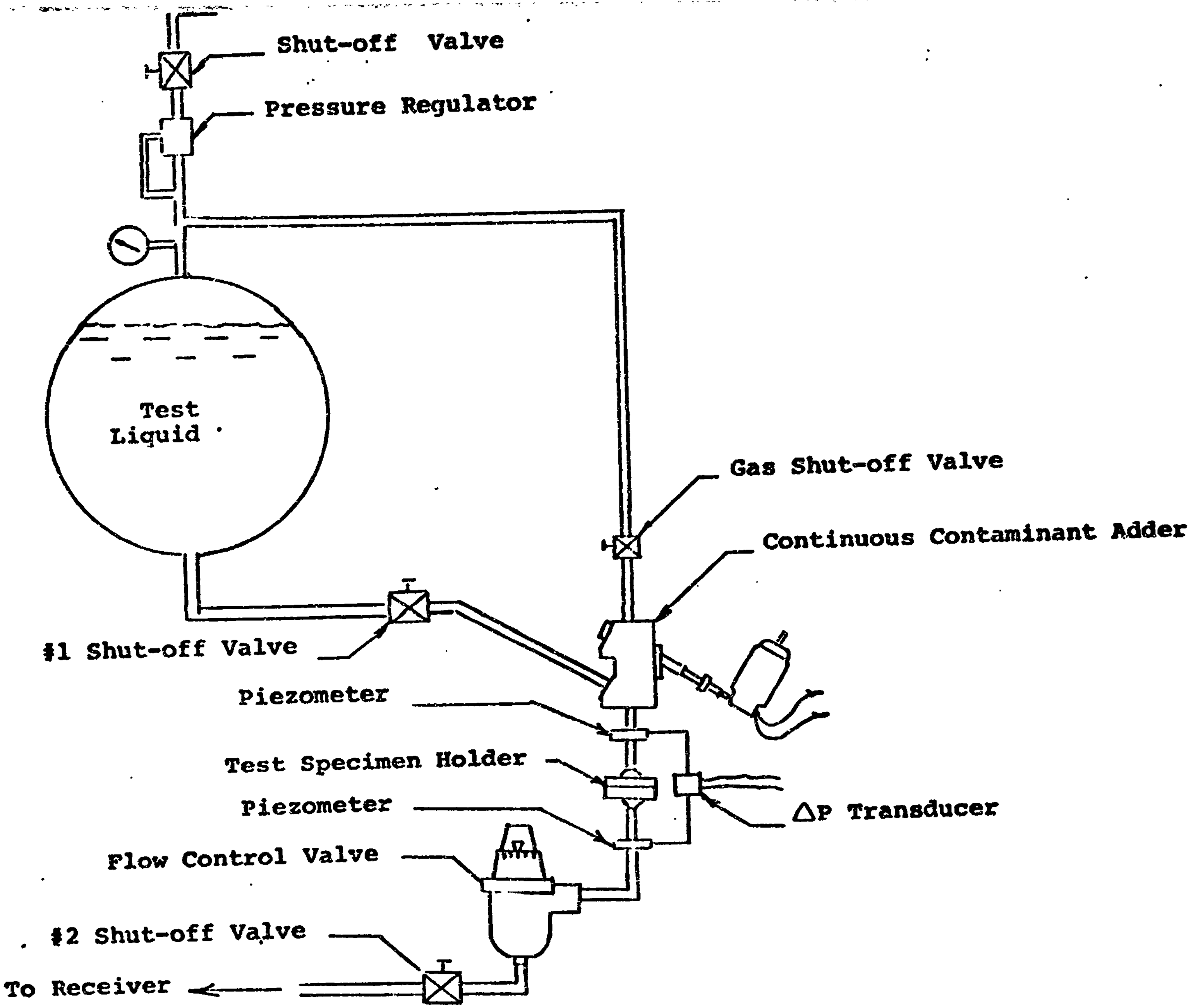


FIGURE D-2

BLOW DOWN SYSTEM SCHEMATIC
USING CONTINUOUS CONTAMINANT ADDER

Figure D-2 shows a simplified schematic diagram of a typical "blow down" system using the continuous adder. Prior to beginning the test, shut off valve #1 upstream of the adder and the flow - control valve and shut off valve #2 downstream of the test specimen are closed. The gas port in the adder is then pressurized to reservoir pressure. At this time, only gas (helium for cyrogenic testing) is contained in the system between the shut off valve and the downstream flow control valve.

With the isolated contaminant adder pressurized to system pressure, the gas pressurization shut off valve upstream of the adder is closed and the fluid shut off valve #1 is opened. No flow occurs, as the system is at balanced pressure. Shut off valve #2 is opened and the flow control valve is slowly opened allowing fluid to enter the adder below the ullage chamber. Back pressure is maintained with the flow control to avoid expansion of the gas in the adder ullage chamber, and flow is set to the desired rate with the flow control valve. The adder motor drive is energized and the test commences.

As contaminant is added, the pressure differential across the test specimen rises, and the flow control valve gradually opens to maintain the set flow rate. The flow control valve is not essential to the test, as flow rate can be controlled by manual manipulation of valve #2. It is essential, however, that all flow adjustments be accomplished very slowly to avoid a sudden drop in pressure downstream of the adder which will in turn cause the gas in the ullage chamber to expand and be lost in the fluid stream.

3.0 TEST PROGRAM

Tests were conducted on the prototype assembly by measuring the amount of contaminant added by weighing the sub-assembly composed of items 3, 12, 13, 17 and 28, first empty, then with AC Coarse Dust compressed into the barrel of item 28. After the test was terminated, the sub-assembly was again weighed. Subtracting the post-test weight from the pre-test weight provided an accurate means of determining the total amount of contaminant addition. Table D-1 shows the weight of contaminant contained in a fully loaded injector. The injector was emptied and reloaded ten times. A 0.25 inch diameter rod weighing 10.8 grams was used to tamp the contaminant into the unit. Light compaction was achieved by using the weight of the tamping rod alone for compaction, whereas heavy compaction could be felt. The tests indicated a high degree of repeatability of injector loading.

Further tests were conducted measuring the amount of AC Coarse contaminant introduced into the system by the assembly. The contaminants were observed to be continuously introduced. At 15 second intervals, readings were made of the weight of contaminant deposited on a pan balance. Table D-2 presents the data and Figure D-3 shows the

TABLE D-1

REPEATABILITY OF DIRT ADDER INJECTOR LOADS

Test No.	Weight Of Injector + Dirt grams	Net Load mg	Deviation From Avg. mg
1	18.3174	724.5	-5.4
2	18.3228	729.9	0
3	18.3228	729.9	0
4	18.3156	722.7	-7.2
5	18.3319	739.0	+9.1
6	18.3250	732.1	+2.2
7	18.3255	732.6	+2.7
8	18.3235	730.6	+0.7
9	18.3303	737.4	+7.5
10	18.3130	720.1	-9.8*

Compaction: 10.8g with 0.25 diameter rod

Weight of Empty Injector.= 17.5929g

Average Load, mg. = 729.9

* Maximum Deviation, %: 1.3

TABLE D-2

CONTINUOUS CONTAMINANT ADDER LOAD RATE TESTS

	Test Run Number					
	1		2		3	
Time, sec	Dirt Add, mg	Accum Add mg	Dirt Add, mg	Accum Add mg	Dirt Add, mg	Accum Add mg
0	0	0	0	0	0	0
15	13.6	13.6	47.6	47.6	-	-
30	67.9	81.5	62.5	110.1	76.2	76.2
45	80.6	162.1	49.4	159.5	54.4	130.6
60	68.2	230.3	63.8	223.3	64.7	195.3
75	71.2	301.5	52.7	276.0	47.6	242.9
90	72.6	374.1	58.3	334.3	64.1	307.0
105	68.0	442.1	52.6	386.9	53.9	360.9
120	68.9	511.0	56.9	443.8	61.7	422.6
135	71.8	582.8	50.7	494.5	52.6	475.2
150	63.7	646.5	58.9	553.4	59.8	535.0
165	-	-	55.0	608.4	48.6	583.6
180	-	-	-	-	-	-
183	152.0	798.5	-	-	-	-
186			46.5	654.9	-	-
187					83.1	666.7
Total Run, sec.	183		186		187	
Total Add, mg.	798.5		654.9		666.7	
Average Add Rate, mg/sec	4.4		3.5		3.6	
Compaction	Heavy		Light		Light	

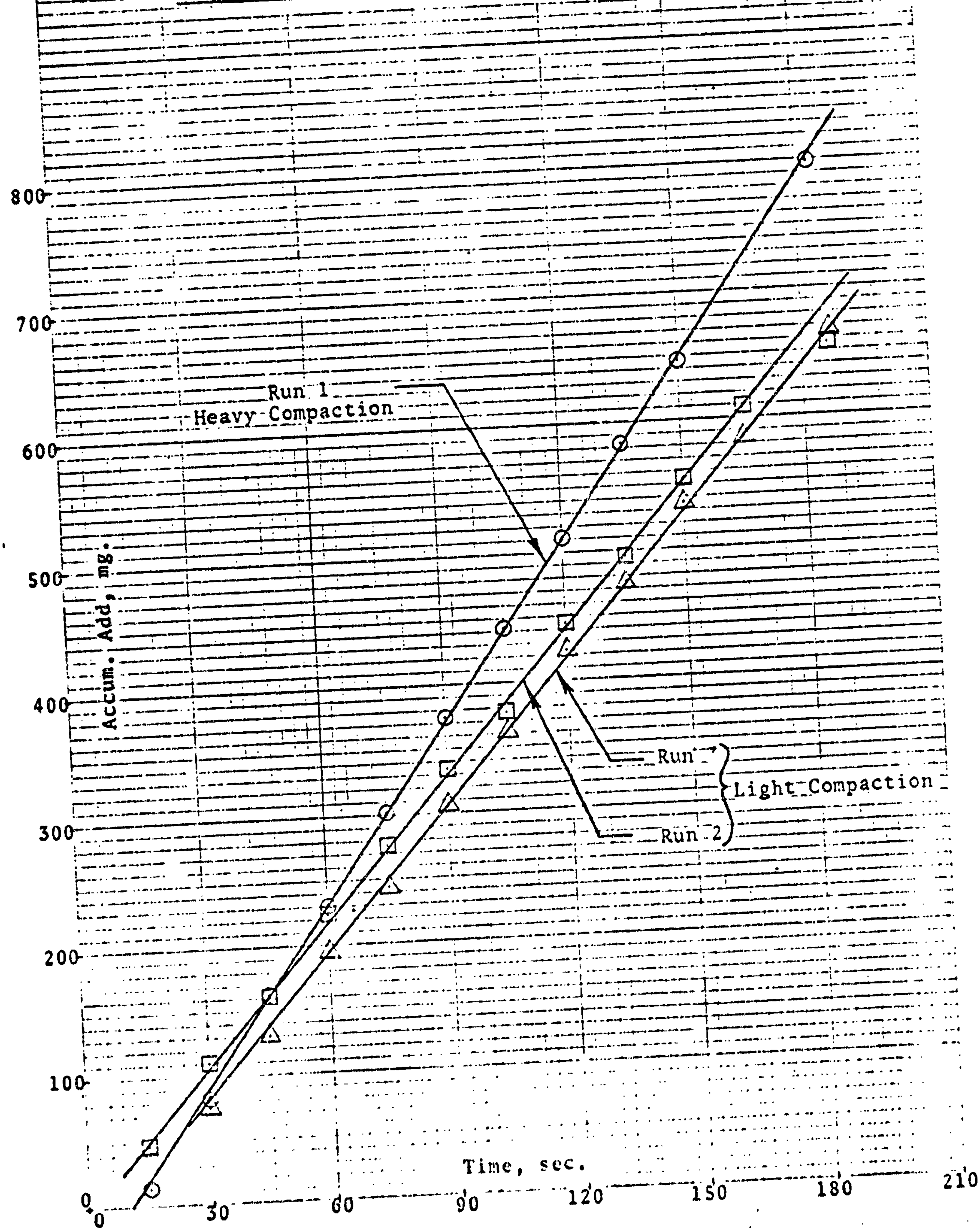
contaminant addition plotted versus time. The greater compaction affects the rate of contaminant addition, but does not change the linearity of addition.

It can be seen that as much as 800 mg of AC Coarse contaminant can be continuously added in approximately 3 minutes duration when operating the motor at 3.8 rpm. This exceeds the normal contaminant weight used in most contaminant tolerance tests and should be adequate for any future tests using the same screen area.

Since these tests showed an excellent degree of repeatability, a micrometer was incorporated into the drive shaft to permit determination of total contaminant added by reading the stroke of the piston. This provides an optional means of determining total contaminant added. The preferred method would be to merely time the operating duration of the test run and refer to Figure D-3, or equivalent, to read the corresponding accumulated contaminant. Since contaminant tolerance tests usually are run until a given (e.g. 50 psid) pressure drop is achieved, the duration of the test is recorded as the pressure drop across the medium rises. Alternately, the output signal of the motor rpm and a differential pressure transducer can be connected to an X-Y or strip chart recorder.

The device was installed with associated piping into a large vacuum chamber and shipped to the NASA White Sands Test Facility for use in contaminant tolerance tests with cryogenic fluids. Figure D-4 shows the continuous contaminant adder assembly installed in the vacuum chamber with the associated plumbing attached. All components shown were assembled and shipped with the vacuum chamber to NASA WSTF for cryogenic testing. The schematic arrangement of the cryogenic test equipment is shown in Figure D-5. Additional tests were conducted at WSTF, but the results were not available at the time the contract was completed.

FIGURE D-3
CONTINUOUS CONTAMINANT ADDER LOAD RATE TESTS



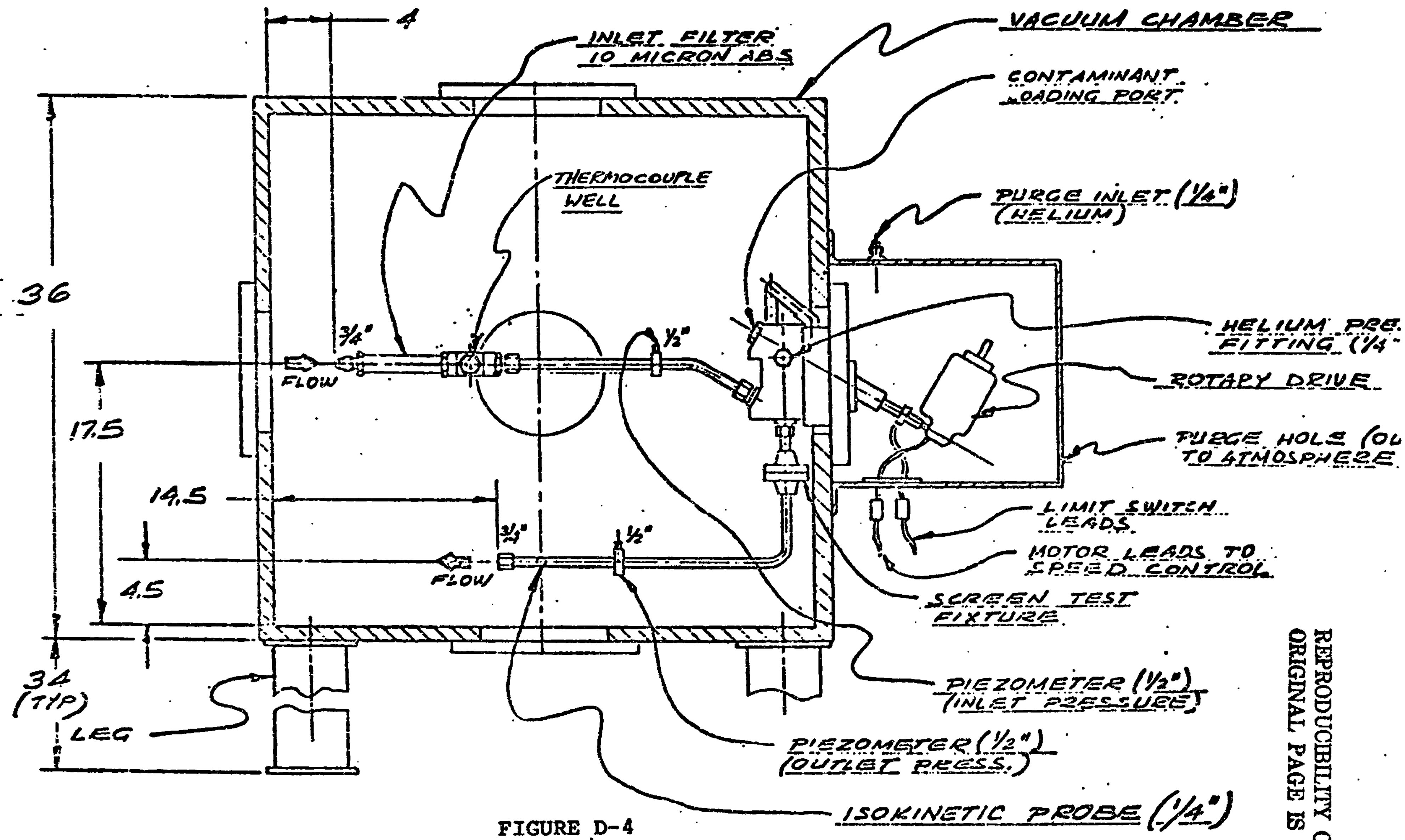
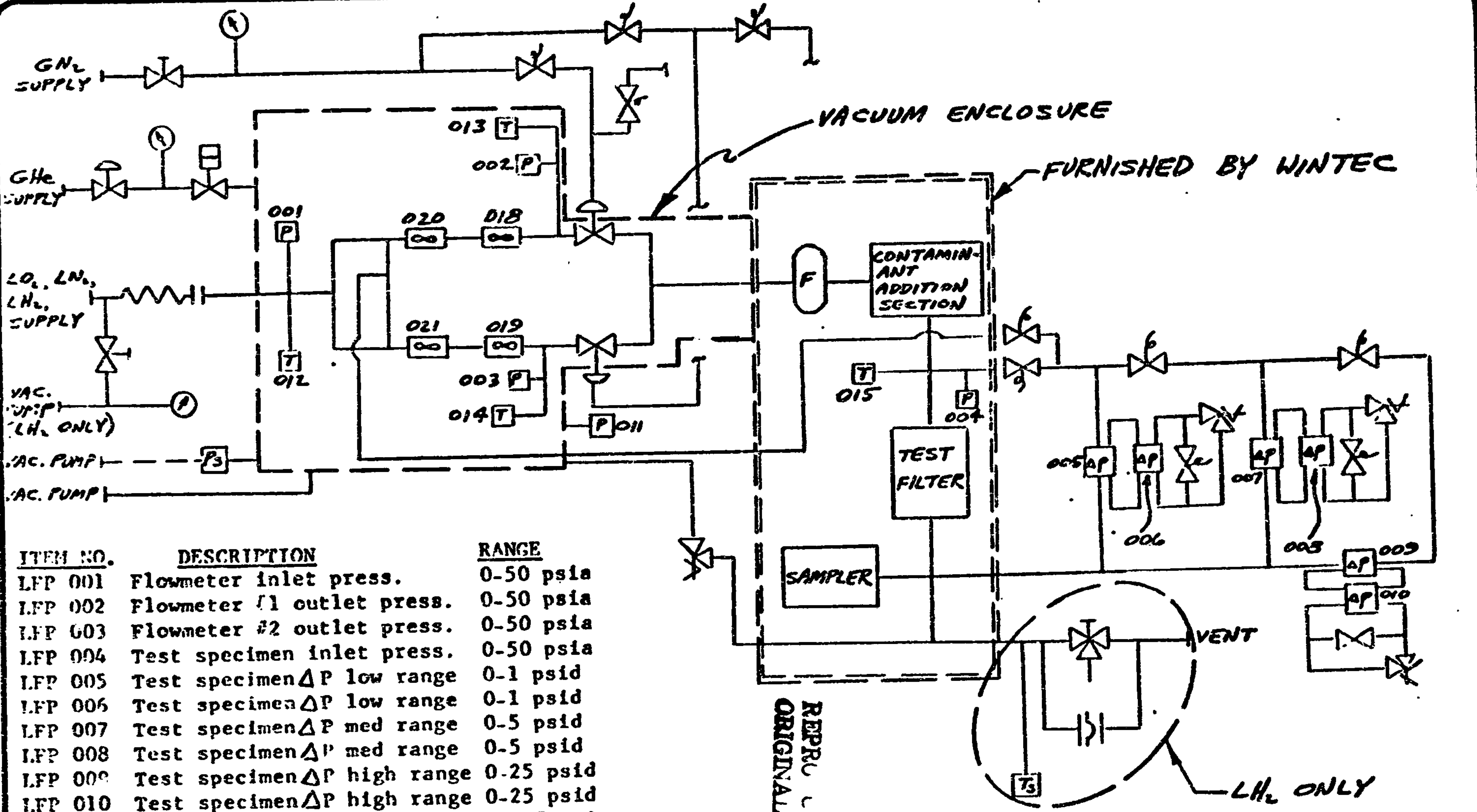


FIGURE D-4

CONTINUOUS CONTAMINANT ADDER ASSEMBLY SYSTEM INSTALLATION DRAWING - CRYOGENIC (Ref. Drawing No. 3-523)



ITEM NO.	DESCRIPTION	RANGE
LFP 001	Flowmeter inlet press.	0-50 psia
LFP 002	Flowmeter #1 outlet press.	0-50 psia
LFP 003	Flowmeter #2 outlet press.	0-50 psia
LFP 004	Test specimen inlet press.	0-50 psia
LFP 005	Test specimen ΔP low range	0-1 psid
LFP 006	Test specimen ΔP low range	0-1 psid
LFP 007	Test specimen ΔP med range	0-5 psid
LFP 008	Test specimen ΔP med range	0-5 psid
LFP 009	Test specimen ΔP high range	0-25 psid
LFP 010	Test specimen ΔP high range	0-25 psid
LFVP 11	Test fixture vacuum	0-0.5 psia
LFT 012	Flowmeter inlet temp.	-430 to -275 F
LFT 013	Flowmeter #1 outlet temp.	-430 to -275 F
LFT 014	Flowmeter #2 outlet temp.	-430 to -275 F
LFT 015	Test specimen inlet temp.	-430 to -275 F
LFX 016	Liquid sensor	-------------
LFX 017	Dirt Add Time	-------------
LFF 018	Flowmeter #1	0.5- gpm
LFF 019	Flowmeter #2	- 12 gpm
LFF 020	Flowmeter #3	0.5- gpm
LFF 021	Flowmeter #4	- 12 gpm

FIGURE D-5

LO_2-AND-LH_2 TEST SYSTEM (WSTF)